All in a Grain of Rice

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Graduate Study and Research in Agriculture
1975

Contents

Contents

Foreword

To those who are unaware of the importance of rice as a food item and as an industry and source of livelihood for the teeming millions of Asia and other parts of the world, *All in a Grain of Rice* may look like much ado about a little thing. To others who are conscious of such importance and who respect scientific research as a tedious, challenging but imperative approach to problems affecting the well-being of the human race, this book makes quite an impression for it is a unique and interesting presentation of the issues and the knowledge that is available, inadequate, or absent relative to the social and economic implications of the new rice technology turned out by research institutions in the nineteen sixties and seventies.

Written by Gelia T. Castillo, a leading rural sociologist, under a study grant from the Ford Foundation, this book initially takes off on the problems associated with the Green Revolution and its new rice technology as perceived by a number of international stalwarts in the socio-economic field, including Clifton R. Wharton, William M. Harding, Wolfe Ladejinsky, Walter P. Falcon, M. L. Dantwala, and Elizabeth Whitcombe, and then it focuses on the Philippine experience, ferrets out the issues and synthesizes the research findings.

Wharton *et al.* pointed up the constraints on the diffusion of the new high yielding rice varieties and anticipated problems that could be generated by efforts to spread these varieties. The problem areas they emphasized involved questions on risk management; the need to expand other industries related to rice production and marketing; pricing policy; consumer reaction, intra-regional consequences of self-sufficiency; manpower requirements for improving the technology on a continuing basis and effects on farm costs, land reform, the quality of life of people, the relative

positions of the rich and poor, and the long range viability of the soil itself.

With these problems as an introductory framework, the author plunges into the Philippine scene by reviewing more than two hundred articles on the history of the rice industry, the introduction, diffusion and adoption of the new rice technology, the agricultural extension services and the rice farmer, income and distribution aspects of the new technology, the Philippine land reform program and the credit and organizational components of rice production.

The questions covered are wide-ranging!

How does a farmer respond to the new technology? What are the factors that explain the farmer's acceptance of new technology?

What was the rationale behind the new plant type of the miracle rice? How fast has been the diffusion and adoption of the high yielding varieties? What are the adoption patterns in the spread of the new technology? Have cropping patterns changed?

What is the role of the extension service? What is its impact in spreading the new technology? What are the sources of information of the farmer? Which of these is most effective in reaching the farmer? How does the farmer obtain needed information? What qualities does the farmer look for in a farm management technician? What is the effect of the presence or absence of an extension service agent?

Has the farmer changed? What is the influence of technology changes on the levels and quality of living of farmers? How have farmers regarded the irrigation service? What is the farmer's own perception of the impact of the high yielding varieties? What is the farmer's reaction to disease outbreaks?

How has the new rice technology affected tractor use? How has tractorization affected employment? Has credit influenced tractorization? What is the trend in tractorization — toward bigger or smaller tractors?

What are the effects of the new technology on tenure and farming status? Have farm labor patterns changed? How far have income ceilings been raised? What is the equity relationship between irrigated and non-irrigated areas? Is there evidence that farmers will return to traditional technology?

How profitable is the new technology? What are its income distribution implications? Has it affected off-farm and on-farm employment? How has the land reform program been affected by the new technology? Are there conflicts between land reform

objectives and productivity? What are the characteristics of landlords and tenants? How have they responded to land reform? Who benefit more from the new technology, the large or small farmers?

What is the role of credit in the spread of the new technology? How have farmers responded to credit availability? What are the effects of credit on tenure status? What has been the experience with farm organization? What are the perceived constraints on efforts to obtain high yields?

The answers to all these questions and many more are not just listed nor merely compiled in this book. They are presented in an organized, analytical form and in a fashion that translates what otherwise might be a boring enumeration of facts and figures into an interesting series of discoveries and disclosures.

Although the book dwells mainly on the Philippine experience, it suggests lessons that could be useful to any one interested in rice problems or, more generally, in the use of new technology as a development instrument to prod an agricultural economy.

Policy-makers, researchers, teachers and students in the rice countries should find this book an absorbing contribution to the ever expanding world of knowledge that is of great value in government planning and program implementation, in agricultural business, or in the classrooms.

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March, 1974

Preface

Long before "miracle rice" was born and before international development experts saw the "evils" which they suspected lurk behind this innocent grain, I have been interested in the rice farmer. He has always been described as traditional and resistant to change and yet simultaneously glorified as the "backbone of the nation." Therefore, when he was dubbed as a "miracle man" for having responded quickly and positively to the new rice varieties and whatever else went with them, I followed the events enthusiastically.

A total of about 186 items have been reviewed for this volume. I have been involved directly or indirectly in a big or small way in a majority of the studies cited here. Almost all of the original authors are known to me personally and I have had the good fortune of having visited most of the study sites. Furthermore, it has been a great privilege on my part to be in close touch with the rice scientists of both the International Rice Research Institute and the University of the Philippines at Los Baños. As a rural sociologist I found it essential to understand the nature of the technology in order not to misinterpret or distort its impact. At any rate, enough data from the original works have been included in order to provide the readers ample opportunity to weigh the evidences for themselves and to arrive at their own conclusions.

What really made me work intensively on this volume is the continuous stream of "visiting firemen" (journalists, economists, sociologists, political scientists, anthropologists, international development agency representatives, etc.) who came to Los Baños, in search of the "truth" as far as the social and economic consequences of the new rice technology are concerned. Inevitably, I suppose, they found the "truth" they came to look for. Otherwise, we would not have as much literature on the subject as we now have.

But more important than the demands of international develop-

ment experts, I found in this subject an avenue for contributing research-based teaching materials badly needed in this country. All the seven chapters contain relevant materials for courses in land reform, agricultural economics, rural sociology, social change, agricultural extension, communication, community development, etc. For researchers, the existing research results have already been synthesized and gaps in knowledge indicated. For policy makers, the research findings themselves suggest where policies and assumptions need to be re-examined. To the scientists who contribute to the never-ending development of suitable technology, it must be quite a revelation to see how much their "grain of rice" has generated optimism, pessimism, skepticism, cynicism, and how much it is being held responsible positively or negatively for many of the world's blessings as well as misfortunes.

For the opportunity to participate in the documentation of the rice story in the Philippines, I have to thank the Ford Foundation who supported the study. The University of the Philippines at Los Baños allowed me a one-year Special Research Detail without pay so that I could devote most of my time in writing. The SEARCA took the risk of funding this publication and appointed Prof. Melanio A. Gapud to edit it. Miss Perla D. Yñiguez and her colleagues in the Department of Agricultural Education patiently typed the original manuscript from my handwritten notes.

My husband, Pol, and my three children allowed me all the time to do this writing because they know Mommy enjoyed it. And finally, I wish to remember my father who will never see the finished product whose influence on my academic pursuits will always be felt.

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Introduction: The Issues

As far as one could tell from the available literature, it was Clifton R. Wharton, Jr. who opened the Pandora's Box of the Green Revolution in his *Foreign Affairs* article of April, 1969[1]. From then on, the temporary euphoria about the glorious victory in the "war on hunger" has suffered some depression. New pangs of pessimism and dark forebodings started to becloud the rosy picture of the future. Because of the near-spectacle and rapidity at which these new grains have swept into the international scene in agriculture and the equally dramatic manner in which they have been written and talked about, it is only to be expected that many unhappy phenomena emerging in this world would also be attributed to these developments. If the number of conferences, experts and publications on the subject were a relevant criterion, the Green Revolution would easily qualify as "The Event of This Decade." Unfortunately, in the midst of all the grim warnings and prognostications, rhetoric seems to come in greater measure than hard data. Therefore, protagonists (fire-eaters, they say) tend to be lined up on either side of the fence hurling stones rather than examining evidences. As one international development agency representative said: "Do we have to wait for the evidences to know the consequences of these technological developments? We all know what the implications are! " The question is:

Do we really know what is happening?

In the search for some answers to this question, this review attempts to do two things:

(1) Present the issues as they had been raised by different people from different vantage points.

(2) Analyze and synthesize relevant information from Phil-

[1]Clifton R. Wharton, Jr., "The Green Revolution: Cornucopia or Pandora's Box," *Foreign Affairs*, April 1969, pp. 464-476.

ippine studies which have a direct or indirect bearing on such issues.

The choice of the Philippines as a setting for this review is not only expedient but also logical because it is the birthplace of miracle rice varieties. Furthermore, the country was supposed to have attained even if short-lived, a state of self-sufficiency in rice after more than half a century of rice importation. However, the rice pendulum seems to be back where it was before. Nowhere else can one therefore find a livelier, more dynamic, more intriguing setting for the analysis of the socio-economic implications of the new high-yielding rice varieties than in the Philippines.

The purpose of this study is not only to bring into focus whatever information or empirical evidences have to say on the burning issues but also to define areas where there is little or no indication at all reasearch-wise, as to what is happening. Hopefully, the synthesis of what is available would shed some light for policy-makers.

A. What is in Pandora's Box?

Despite the "unparalleled opportunity" offered by the Green Revolution to "break the chains of rural poverty in important parts of the world," Wharton believes that the further spread of new varieties will not be as early successes might suggest for the following reasons:

(1) The availability of irrigated land imposes at least a short-run limit to the spread of the new high-yielding varieties.

(2) There are doubts about the ability of existing markets to handle the increased product.

(3) The adoption of the new technology is likely to be much slower where the crop is a basic food staple grown by a farmer for family consumption.

(4) Farmers must learn new farming skills and expertise of a higher order than was needed in traditional methods of cultivation.

(5) Many of the new varieties are non-photosensitive and the shorter term will allow two or three crops per year instead of one. Multiple cropping is good but there may be difficulties if the new harvest comes during the wet season without provision . . . for mechanical drying of the crop to

replace the traditional sun drying.

(6) Failure to make significant institutional reforms may well be a handicap . . . The first or early adopters of the new technology will be in regions which are already more advanced, literate, responsive and progressive. . . in sum, the wealthier, more modern farmers. . .As a result of different rates in the diffusion of the new technology, the richer farmers will become richer.

On the other hand, if the new varieties spread rapidly and widely, Wharton thinks that the increased production will lead to a new set of difficulties:

(1) Large tracts planted to one of the new varieties may be susceptible to disease and infestation which could cause massive losses.

(2) It is vitally important to expand the entire complex of services and industries required to achieve the higher production.

(3) Much more attention must be devoted to marketing the increased output.

(4) The slowness with which the food-deficit psychology dies also has an important consequence in terms of government pricing policies.

(5) The goals of increased food production are frequently couched in terms of some desirable, minimal standards of nutrition. . . If the increased production leads to lower costs and prices, then consumers will be able to increase their food purchases and hopefully to raise their levels of nutrition.

(6) One of the major avowed aims of most nations which are eagerly promoting the Green Revolution is to achieve self-sufficiency in food production. . . Self-sufficiency will not only be detrimental to the rice-exporting nations but will also reduce one of the few areas of economic interdependence in the region.

(7) A critical question is whether these technological developments are a "once-and-for-all" phenomenon. How likely is it that new technological improvement will continue to be made? . . . The target should be not a new technology but ever-new technology and this requires skilled manpower.

From another point of view, Harding argues that although the

growth of high-yielding varieties should be encouraged to the maximum because of the millions of hungry people in the world, he hopes that the other aspects of science and technology which must go along with that revolution would not be overlooked, such as: "the effects of change on farm income and farm costs; the dislocation of rural people; the demands for education; the need for industrial development; the requirements of urbanized society; the rigidities of world trade, etc." Philosophically he finds that a good deal could be said for not harnessing science and technology for the "the values of the traditional rural society are difficult to surpass." He recalls how the mechanization of agriculture in Saskatchewan had affected the entire social fabric of society but "neither the individual farmer nor the machinery dealer involved in the transaction of buying and selling a tractor had any conception of the effects of their action when it was multiplied one hundred thousand times. Neither realized the social costs which would ensue. Neither could foresee the denudation of the countryside, the new cost structure of agriculture, the movement of people, the unemployment, the erosion of friendly, comfortable communities, the general dislocation in the countryside and the urban centers. Nor could they foretell that the relative net income situation of the farmer would not improve." Insofar as agricultural productivity is concerned, the question posed is: "Agricultural production for whom? Who receives the benefit? The farmer? which farmer? . . . does it reinforce the present farming community. . . or destroy it? — and who pays the cost of destruction? " Harding further stresses the need to consider the goals of the farmer whom he describes as a cautious person who, in assessing the potential of a new variety of grains will not accept anyone's word as to how well it will produce. The farmer must not only see for himself but will also want to know if the product will sell as well as other varieties; what additional inputs are required and what will happen to the price of inputs after he makes the change and becomes dependent on them. Finally, he argues that progress will be judged on the *quality of life* and *social stability of the nation.*[2]

Ladejinsky, a long-time stanch supporter of agrarian reform, has this to say: ". . .while the green revolution is the most promising portent for a sharp rise in agricultural productivity, at the moment it

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[2]William M. Harding, Toward Harnessing Science and Technology for Agricultural Productivity and Community Development. Paper presented at the Third International Seminar on Communications Strategies in Community Development, UNESCO, U.P. Institute of Mass Communication, Diliman, Quezon City, December 17, 1970.

is anything but a boon for the unfinished business of agrarian reform in Asia. At this stage of technological changes taking place in India, for example, there are ample signs that the burden of the change falls squarely on the tenants; numbers of them have already been 'separated' from the land before the advent of the green revolution and more are in danger of facing the same process in consequence of the green revolution. . . The most encouraging aspect of the shift from traditional to modern farming is not so much the physicai output as the increasing use of output or the willingness of the farmers to invest and take risk – and to be well-rewarded for it as is indeed the case. Aside from this and further improvements in store, the new widespread psychological attitude about the effectiveness of the new farm practices is of unquestioned importance. The desire for better farming and a better standard of living is evident not only among the relatively few 'revolutionaries' but also among a great many farmers who for a variety of reasons are still only onlookers of the new package of practices. To those concerned with purely physical indicators of economic growth, a psychological change of this sort is not subject to numerology and is probably of no account to them as a development factor. But it cannot be denied that a new, if unquantified factor of growth has been introduced." On the seamy side, Ladejinsky argues "that the drive for higher productivity does not necessarily alleviate the condition of the rural have-nots, leaving many by the wayside. The propitious circumstances in which the new technology thrives, like adequate resources to begin with, are not easily obtainable for multitudes of the smaller farmer-owners, not to speak of tenants with additional problems of their own. Hence, the inevitable constraints on its scope and the limited involvement of these groups of farmers. . . In the absence of appropriate counter measures the benefits of development, whether governmentally sponsored or not, often result in the law of increasing returns to the rich or the rich getting the most and the poor the least. In India, the new agricultural strategy is beginning to demonstrate that in the form of rising violence in the countryside between the haves and have-nots. . . There is manifested concern that for all the green revolution's technological feasibility it might fall short in affecting positively and, in effect, adding to the crucial problems of unemployment, inequalities in income distribution – both relatively and absolutely – rising sense of social injustice and, as a part of all this, the apparent perpetuation of an outmoded and exploitative tenurial structure." Citing the case of Punjab, Ladejinsky

points to making money as a new way of life which is characterized by more and more tubewells, more of all other inputs and bigger crops but laments the absence from the process of a majority of the cultivators, thus leading to income polarization on a widening scale. The assumption that the new technology is neutral to scale, according to him, breaks down in the sense that a large number of cultivators lack resources or are institutionally precluded from taking advantage of the new agricultural trends. As far as tenancy is concerned, the green revolution has pushed up land values and consequently, land rents. Security of tenure is also threatened because "the owners would like to complete the enclosure process of reducing the tenants to the lowly status of agricultural laborers." The other issues relate to labor and mechanization. "The new type of farming with its land-saving and labor-demanding practices and double-cropping is labor intensive on primary, secondary, and tertiary levels. . . The very same practices, however, also give rise to labor-saving devices such as tractors, rotary ploughs, harrows and tillers to go with them, electrically operated tubewells, sprayers and threshers — to mention modern equipment already on the farms of many of the new practitioners of modern farming." Although there are both labor-absorbing and labor-displacing practice, "the employment outlook gets darker as the technology and farm practices grow in sophistication and as the entree into the labor market rises which is of course the case." Finally, if the efficacy of the new technology does not find the company of agrarian and other related reforms long overdue, "the green revolution might turn red."[3]

In a slightly different packaging but with essentially the same ingredients, Walter Falcon writes about the *generations of problems* associated with the green revolution such as: the first generation of great production successes but important limitations; the second generation problems of marketing, markets and resources allocation; and the third generation problems of social forces and uncertain consequences. Although his assessment of the green revolution is hardly one of wild enthusiasm, his purpose has not been to argue that it should not have happened or to deny its great production successes in certain regions. His intent is to point out how limited a solution the revolution is given the broader development problems of South and Southeast Asia. The four themes which stand out in his

[3]Wolfe Ladejinsky, Agrarian Reform in Asia, The Green Revolution and its Reform Effects. Paper presented at the 28th International Congress of Orientalists, Canberra, Australia, Jan. 6-12, 1971.

analysis are: (1) Despite the impressive gains to date, the term revolution can only be used correctly to describe about 10 to 15 per cent of Asia and one of the greatest second-generation obstacles are the individuals who believe that the first-generation solutions have been found. (2) The sudden increases in agricultural output have already or will soon necessitate basic pricing decisions on the part of governments. (3) Although the limited technological revolution in agriculture has permitted an easing of one critical development constraint, it has not provided a panacea for solving the employment and equity problems and might have been destabilizing in terms of widened income disparities within and between regions. (4) The great challenge of the future will be to forge institutions that can deal simultaneously with the demographic explosion, rapid economic growth and equality of income distribution.[4]

M. L. Dantwala, in his analysis of the relative roles of technology, economic policy and agrarian institutions in explaining stagnation of growth suggests that: "In the absence of a technological breakthrough the many otherwise highly relevant policies – land reform, economic incentives and institutional changes, jointly and severally could not have lifted agriculture above its stagnation threshold. Land reforms and other institutional changes were not successfully carried out, but a thought occurs that perhaps the very stagnation of agriculture inhibited their success. When yields were miserably low, it was difficult to get enthusiastic about lowering the ceiling on holding or drastically reducing the rents. Speaking about India extremes apart, if there is injustice or exploitation, it is, by and large, of the poor by the less poor. Sure enough, even after the abolition of the intermediary tenures – from over 170 million acres of land – there are several pockets of absentee landlordism. Yet, the bulk of the India agricultural sector is poor and depressed even by India's urban standards. Under such circumstances, how much scope was there for divesting or expropriation of the 'rich'? Now that the possibilities of making a fortune in agriculture have opened up, land reforms can play a vigilant corrective role.

"As for agricultural prices, when yields were in the neighborhood of one (1) ton per hectare, it was a mockery to talk of incentives through higher prices. But if new technology is to be adopted, it is essential to assure the innovating farmers that their efforts to adopt

[4]Water P. Falcon, The Green Revolution: Generations of Problems. Paper presented at the Summer Meeting of the American Agricultural Economists' Association, Columbia, Missouri, Aug. 9-12, 1970.

it will not be allowed to be frustrated by unremunerative prices.

"It may be argued that the discovery of high-yielding varieties was not a gift from heaven, and but for appropriate policies, they would not have seen the light of the day! Whose policies? Probably of the Rockefeller and Ford Foundation whose generous grants made it possible for the scientists in Mexico and the Philippines to evolve the high-yielding varieties. The revolution was the reward of scientific research and not of the wisdom of economists; few even dreamt of it and many even do not believe it. It is our professional privilege and duty to question its occurence or its consequences – Palace Revolt, Pandora's Box, Seeds of Disaster, Dualism – but let us not get into a stance that nothing good can ever happen in this country (India)."[5]

On the technical problems posed by the Green Revolution, the most stern warnings come from Elizabeth Whitcombe, in her analysis of the *New Agricultural Strategy in Uttar Pradesh.* Her apprehension arises from the prominent role which fertilizer plays in the growth of the new high-yielding varieties and its long-term consequences on soils in high temperature zones which have a chronic incapacity to store nitrogen. She asks: "How are the mechanical properties of alluvium to be sustained and their water retentiveness strengthened?" Furthermore, she points out that the new grains have a water-demand which is at least double that of indigenous and locally improved cereals, hence making irrigation areas to be measured not only in terms of "patchy soil-water deterioration by water logging and salinity or in the depletion of aquifers by excessive tubewell demand" but also in relation to significant water losses from irrigation installations which lack lined distribution channels. In addition, she has doubts as to whether the performance of the high-yielding varieties would continue over a period of years considering genetic instability, hence the need for constantly renewed seeds to maintain yield levels. Then too, "the high-yielding varieties have a notoriously low threshold of resistance to disease." Finally, in her eloquent presentation at the *28th International Congress of Orientalists,* January 1971, she called for a moratorium on the tubewells.[6]

[5]M. L. Dantwala. "From Stagnation to Growth: Relative Roles of Technology, Economic Policy, and Agrarian Institution." Presidential Address, Indian Economic Association, Fifty-third Annual Conference, Gauhati December 1970.

[6]Elizabeth Whitcombe, The New Agricultural Strategy in Uttar Pradesh. Paper presented at the 28th International Congress of Orientalists, Canberra, Australia, Jan. 6-12, 1971.

The political scientists have certainly not been silent bystanders in the quest for Pandora's Box. Besides dwelling on the usual issues which are the bread and butter of the economists, Francine Frankel brings to the fore the so-called political costs of the new agricultural strategy in India. She is concerned that "at the least, efforts to ensure the essential conditions of success for the new agricultural approach seem bound to commit India more closely to an entrepreneurial or capitalist strategy of development in all sectors of the economy with the attendant political risks of intensifying economic inequalities and social conflict. They also appear certain to involve her in closer economic dependence on American and other foreign private investors and to increase the constraints on an independent foreign policy. It even seems likely that the new agricultural strategy will weaken the very foundations of central planning by concentrating an even greater proportion of the agricultural surplus in the hands of large landowners — the very group all state governments in India, regardless of party identification, have found politically impossible to tax."

The journalists, far from being insensitive to the issues, have certainly contributed their share to the vitality of the forum. For example, one writer said that the Green Revolution has brought "a new style of living" and has shown a vast potential for good. William P. Bundy recognizes that "although only a fraction of Asia's arable land can at this stage be adapted to the new techniques, the gains made and in prospect have deferred the threat of widespread famine - visible for the late 1970's only five years ago — for twenty years or more. And this fundamental change ignores ideological boundaries, for there is evidence that North Vietnam and probably Communist China have acquired large quantities of the new seeds. At the very least, Asia has been given time to find new economic and social structures to get on — much too slowly — with control of population. Only if one prefers starvation as a goad to social progress can one offer serious argument against the Green Revolution as a whole. Yet no one is more aware than the men who have participated in it that the revolution has created a host of special problems for the 1970's." He suggests that if small holders are to participate on equal terms with medium and large holders, there must be cooperatives. Citing the case of West Pakistan, where the government is said to have encouraged and even catered to the advantage of the latter groups by, for example, subsidizing tractor sales, he sees added strain to an already skewed rural social structure.

"Some think this helped the extremist politics of Zulfikar Ali Bhutto in the West Pakistan election of last year. The immensely difficult trick is to minimize dislocation, improve equity and keep people on the farms, at a time when already advanced trends to bloated cities and vast unemployment loom as the central problems of the 1970's." In a most elegant concluding paragraph, Bundy says: "Like all true revolutions, the green one has now acquired its own dynamics. It cannot stop and can probably only go faster – for example, as the vital protein content of basic food grains is increased by plant breeding now in advanced stages. As new methods spread and multiply so inevitably will the accompanying problems of organization and equity. No part of Man's whole condition at the moment is more laden with drama."[7]

Although most of the writers mentioned issues with reference to India, it is equally relevant to ask the same questions of other countries participating in the Green Revolution. As a matter of fact, it would be extremely valuable to find out how much of what has been said is indeed occurring in different places and how these phenomena manifest themselves within and between countries. With systematic probing into what is known, there should be no shortage of materials for further drama – but perhaps more tied to reality than to rhetoric.

B. What's with Cornucopia?

In a way the situation of the Green Revolution is akin to that of Uncle Sam with respect to the granting of foreign aid – "damned if he does and damned if he doesn't." The two major concerns have to do with constraints on the further spread of the technology and if such bottlenecks were overcome, one worries about the "evils" which come with such "success." At least as far as the literature is concerned, the Green Revolution is a born loser because whatever happens or does not happen is accompanied by a host of problems associated with either scarcity or abundance or both. It is more objective, therefore, to view the phenomenon in this context and from this perspective proceed to examine the nature, trends, and if possible, magnitude of the problems which it brings. Whether the consequences are positive or negative depends very much on who is evaluating and the values he holds. Given an indication as

[7]William P. Bundy, "How fares the ugly American?" *Newsweek*, Aug. 23, 1971, p. 52.

to what is happening, a policy-maker should be able to choose a course of action congruent with his scale of preferences and the corresponding consequences, both anticipated and unanticipated.

In this spirit and using the issues in Pandora's Box as a take-off point, as a framework, an analysis and synthesis of available empirical evidence is attempted. The entire study includes seven chapters:

1. The Philippine Rice Situation Through the Years
2. The Introduction, Diffusion and Adoption of the New Rice Technology.
3. Agricultural Extension Services and the Rice Farmers
4. The Changing Filipino Rice Farmer
5. Employment and Income Distribution Aspects of the New Rice Technology
6. The Philippine Land Reform and the New Rice Technology
7. Credit, Cooperatives and Other Organizational Components of Rice Production

1

The Philippine Rice Situation Through the Years

It is impossible for anyone to comprehend the meaning of the new rice technology to rice production in the Philippines, unless he has some idea about the general rice situation in the country through the years. Table 1.1 shows that rice production data (total volume and hectarage devoted to production and yields per hectarage) from 1902-03 to 1970-72.[1] An examination of yields per hectare shows certain identifiable periods:

(a) 1902-1916, with yields below 20 cavans per hectare;
(b) 1910-1925, yields climbed to about 24 cavans;
(c) 1925-1934, stable yields of 26 to 28 cavans;
(d) 1934-1948, decline from the previous period to about 23 to 25 again;
(e) 1948-1965, a stable period of 26 to 28 cavans;
(f) 1966-1972, a new period starting with more than 30 cavans per hectare level.

The area devoted to rice production increased continuously from 593,000 hectares in 1902-03 to 1,965,480 in 1938-39. From 1939, the area expanded from 2 million to almost 3 million hectares in 1957. The rice area rose to more than 3 million from 1957 and had remained between 3.1 and 3.2 million hectares since then to 1972. Expansion of rice area has probably reached its limit by now. Rice production in the Philippines can be described quite accurately as *continuously low, stable yields per hectare for about half a century.* In 1965, Ruttan *et al.* in a comprehensive analysis of the inhibitory effects of environment on the response to modern agricultural technology in the Philippines and Thailand, concluded that both the yield increases in the last decade and the yield differences among major rice-producing regions in the Philippines and Thailand primarily reflect

[1] E. C. Venegas and V. W. Ruttan, An Analysis of Rice Production in the Philippines, *Economic Research Journal*, Vol. II, No. 3, Dec. 1964, pp. 159-180.

Table 1.1. Rice production in the Philippines in cavans, hectares and yield per hectare.

Year	*Cavans*	*Hectares*	*Yield per hectare in cavans*
1902-03	11,466,000	593,000	19.34
1908-09	17,394,016	1,156,105	15.05
1909-10	18,859,090	1,192,140	15.82
1910-11	20,530,100	1,043,760	19.67
1911-12	11,622,470	1,078,890	10.77
1912-13	24,498,860	1,141,240	21.47
1913-14	22,736,810	1,244,940	18.26
1914-15	17,818,490	1,130,710	15.76
1915-16	20,878,860	1,140,830	18.30
1916-17	28,276,720	1,225,690	23.07
1917-18	35,795,050	1,368,140	26.16
1918-19	33,781,650	1,391,340	24.28
1919-20	36,343,810	1,484,890	24.48
1920-21	41,478,540	1,673,580	24.78
1921-22	43,436,830	1,661,430	26.14
1922-23	43,790,500	1,765,370	26.14
1923-24	41,570,700	1,757,910	23.65
1924-25	45,652,600	1,725,500	26.46
1925-26	47,780,000	1,755,920	27.21
1926-27	49,496,400	1,807,060	27.39
1927-28	49,921,200	1,786,690	27.94
1928-29	49,786,400	1,775,460	28.04
1929-30	51,586,900	1,812,800	28.46
1930-31	49,640,300	1,790,610	27.72
1931-32	47,290,200	1,781,630	26.54
1932-33	47,843,000	1,853,720	25.81
1933-34	53,001,200	2,004,030	26.45
1934-35	45,825,100	1,964,070	23.33
1935-36	42,219,600	2,048,700	20.61
1936-37	55,015,730	2,060,960	26.69
1937-38	52,345,210	1,912,050	27.38
1938-39	52,193,430	1,965,480	26.56
1939-40	53,698,780	2,080,380	25.81
1940-41	54,129,940	2,289,190	23.65
1941-42	55,494,000	2,318,560	23.94
1942-43	–	–	–
1943-44	–	–	–
1944-45	–	–	–
1945-46	36,893,940	1,649,960	22.36
1946-47	47,460,000	1,879,600	25.25
1947-48	50,928,480	2,026,380	25.13
1948-49	56,620,200	2,164,100	26.16
1949-50	59,118,600	2,244,000	26.75
1950-51	59,463,400	2,251,800	26.41
1951-52	64,335,120	2,466,040	26.09

44 kg / Cav.

Table 1.1 (Continuation)

Year	*Cavans*	*Hectares*	*Yield per hectare in cavans*
1952-53	71,458,060	2,655,000	26.92
1953-54	72,328,000	2,645,440	27.34
1954-55	72,793,300	2,655,540	27.41
1955-56	74,393,900	2,742,480	27.13
1956-57	76,044,200	2,768,120	27.47
1957-58	72,806,300	3,154,100	23.08
1958-59	83,738,700	3,329,410	25.15
1959-60	84,988,800	3,306,460	25.70
1960-61	84,199,000	3,196,750	26.33
1961-62	88,863,800	3,179,190	27.95
1962-63	90,158,700	3,161,320	28.52
1963-65	89,301,800	3,150,000	28.38
1965-66	92,559,900	3,109.180	29.8
1966-67	94,660,500	3,081,170	30.8
1967-68	103,700,000	3,304,000	31.4
1968-69	101,000,000	3,332,000	30.3
1969-70	118,900,000	3,113,000	38.2
1970-71	121,400,000	3,112,000	39.0
1971-72	115,900,000	3,246,000	35.7
1972-73 (Forecast)	113,000,000	3,229,000	33.9

NFAC – APC National Average Yields for Programmed Areas*

	Cavans per hectare
1967-68	43
1968-69	43
1969-70	49
1970-71	52

Source: Data were obtained from E. C. Venegas and V. W. Ruttan, An Analysis of Rice Production in the Philippines, *Economic Research* Journal, (University of the East), Vol. 11, No. 3, 1964, pp. 159-180; C. Crisostomo and R. Barker, IRRI Saturday Seminar, Nov. 27, 1971; and the Bureau of Agricultural Economics, Department of Agriculture and Natural Resources.

*R. Feuer and P. W. Resma, "Progress in the Adoption of HYV of Rice in the Philippines." IRRI Thursday Seminar, Jan. 27, 1972.

variations in the environmental factors under which rice is grown rather than differences in variety planted or cultural practices. After the effects of the environmental factors are taken into account, there is little yield increase or yield differential left to be explained by such factors as new varieties, better cultural practices or more intensive use of technical inputs such as fertilizer and insecticides or by economic and social differences among regions and between Thailand and the Philippines.

One major implication drawn by the authors is that the factors which permit a region to increase its yields to the levels currently being achieved in the higher yielding areas of each country are primarily outside the control of the individual farmer in the major rice-producing areas such as Central Luzon or Central Thailand. The modifications in the environment necessary to achieve effective water control (irrigation and drainage) and effective pest control will have to come primarily from public or semi-public agencies capable of organizing resources in a manner not available to the individual tenant or farm owner.

A second major implication is that the same limitation on environmental control which prevents farmers from achieving the yield potentials inherent in existing varieties will represent an equally severe limitation on achievement of the yield potentials inherent in the new varieties which are being designed to be ever more sensitive to effective environmental control, technical inputs and management than existing varieties.[2] It should be pointed out that data for this analysis included up to 1963. New varieties referred to in the study were those developed by the Bureau of Plant Industry and the University of the Philippines College of Agriculture before the advent of short, stiff-strawed, nitrogen-responsive, non-photo period sensitive varieties developed by the IRRI and comparable varieties released by the U.P. College of Agriculture. In Table 1.2, the new yield period at the 30 cavans per hectare level occurred also at the time when the new HYV's have been diffused, irrigation rates have increased, but hectarage has remained stable. Barker shows in Table 1.3 that the Philippines with 50 percent of crop area in HYV by 1970-71 had experienced an annual output growth rate of 3.1 percent with 91 percent of the growth rate explained by increased

[2]V. W. Ruttan, A. Soothipan and E. C. Venegas, Changes in Rice Production, Area and Yield in the Philippines and Thailand. Paper presented at the Annual Meeting of the Thailand Agricultural Economics Society, Bangkok, Thailand, July 10-12, 1965.

Table 1.2. Philippine rice yields and irrigation rates, 1948/1970, three-year averages.

Period	*Yield in cavans per hectare*	*Percent of crop area irrigated*
1948/50	26.11	19
1951/53	26.56	n.a.
1954/56	27.24	22
1957/59	25.20	24
1960/62	26.56	28
1963/65	28.38	31
1966/68	30.42	38
1968/70	33.14	42

Source: R. Barker, *et al.,* Employment and Technological Change in Philippine Agriculture. Paper prepared for ILO, Oct. 1971, Table 2.

yield. In another paper, Crisostomo and Barker[3] recognize the fact that it is impossible to consider the effects of expansion of irrigated areas and decline in non-irrigated ones independently and, therefore, find it impossible to say precisely how much of the growth rate should be attributed to HYV. They likewise acknowledge that "the yield gains have not come up to the expectations of scientists and policy-makers."

Table 1.3. Proportion of output growth explained by increased crop yield among 4 Asian countries.

Country	*Crop*	*Percent crop area in HYV 1970-71*	*Output Growth in Percent*	
			Annual 1960-64 to 1968-70	*Proportion explained by increased yield*
India	Rice	15	2.0	57
	Wheat	33	7.9	70
Philippines	Rice	50	3.1	91
Burma	Rice	4	1.2	39
Thailand	Rice	2	5.3	47

Source: Randolph Barker, "The Economic Consequences of the Green Revolution in Asia," *Rice, Science and Man,* IRRI, Los Baños, Philippines, 1972, pp. 127-142.

[3]C. Crisostomo and R. Barker, Growth in Philippine Agricultural and Rice Productivity: The Impact of the HYV's, IRRI Saturday Seminar, Nov. 27, 1971.

Efferson, in his analysis of world rice production, was much less willing to attribute production increases to either HYV's or irrigation. As he puts it:

> "Some observers have attributed the increase in rice production in recent years largely to the introduction of the new improved varieties plus the additional inputs and intensified extension work supplied with these varieties. A closer look at the timing of the increases and at the areas in which they occurred leads to the conclusion, however, that much of the increased production was due to factors other than the new varieties and the additional inputs. Data on rice production from major rice-producing areas in Asia indicate that the most substantial increase in production from 1966 to 1967 occurred before HYV's were widely planted. Between 1969 and 1970 when planting of HYV expanded greatly, total production increased only slightly and it declined in 1971. Much, if not most of the rice production increase that has occurred in Asia in the last six years should be credited to favorable weather during the latter years of the period along with the one percent annual increase in crop area. The rest of the increase can be credited to the HYV, the additional volume of fertilizer, pesticides, and other inputs used, the intensified extension education program and the development of improved irrigation systems to provide more stable water supplies in the wet season and occasionally a second crop in the dry season."

He added further that "in Asia, variable weather is likely to continue to be the most important influence on the production of rice. Low production years will occur occasionally just as they have in the past. Also in any given rice area in monsoon Asia, the maximum impact of the improved varieties, added inputs and new methods can be obtained only when more and more of the region is provided with effective water control and irrigation. This will take time."[4]

Efferson cites the following rice production figures for the Philippines: From 1964, it was 4.0 million tons; in 1965 and 1966 it was 4.1; in 1967 and 1968 it was 4.4. and 5.2 in 1969; 5.3 in 1970 and 5.2 in 1971. If one were to take Efferson's argument in relation to Philippine rice production figures cited in Table 1.1 from 1902 to 1965, it would lead to the conclusion that low rice production through the years has been due mainly to continuous bad weather for more than half a century, with good weather effects reflected only in the 1966 to 1971 production figures. But even in the

[4]J. Norman Efferson, "Outlook for World Rice Production and Trade," *Rice, Science and Man*, IRRI, Los Baños, Philippines, 1972, pp. 127-142.

statistics he mentioned for 1969 to 1970, the production was much higher than in 1964 and in 1971 it went down slightly but not to the 1964 level despite the very unfavorable weather experienced by the country in 1971 and despite the relatively stable hectarage planted to rice during the period. It would seem that a long-term production trend provides a better basis for arriving at some explanation rather than confining the analysis to the 1964 figures.

The story of rice in the Philippines is a history of recurring shortages. To illustrate this dramatically, a news item dated March 10, 1872 had the caption *Rice Shortage Feared* and went on with the following description:

> "The problem of rice shortage was feared to upset the economic conditions in the islands during the next several months. Government authorities made this observation in view of the destruction caused by the *gusano,* a black and yellow maggot ravaging all the ricelands in the province of Central Luzon. . . . In Cagayan and Camarines Norte, floods brought about by continuous heavy downpour place all the rice plants underwater. In Camarines Sur, the local authorities were compelled to pass ordinances forcing the farmers to plant other crops such as corn, sweet potatoes, gabi, and other tuber plants as substitute to rice."[5]

On about the same date but only a century later, March 11, 1972, the caption of the news item was *NEC Certifies Rice Shortage* and went on to say:

> "The National Economic Council yesterday certified an additional rice shortage of 200,000 metric tons. . . NEC Chairman Gerardo Sicat said that the 300,000 metric tons rice import the government recently contracted from Thailand was not sufficient to meet consumption requirements up to September 30. The total importation is the biggest in the country's history, exceeding even that of last year's which totaled 460,000 metric tons."[6]

The circumstances obtaining before the advent of HYV's and the nature and magnitude of the existing pressures for increasing rice production need to be underscored, because one must never forget the setting in which the new rice technology was introduced. Since technocrats determine to a large degree what policies the government eventually pursues, their definition of the problem is indicative of their concerns. Umali, in his discussion of the rice dilemma in 1961, started with a picturesque introduction. He said:

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[5]Renato R. Perdon, "A Century Ago Rice Shortage Feared, *"Philippines Herald,* March 10, 1972, p. 5.

[6]*Philippines Herald,* NEC Certifies Rice Shortage, March 11, 1972, pp. 1-2.

"Last September, threatened by hunger, our country was a frightened nation. The President of the Philippines acted promptly by declaring a state of national calamity and by ordering the Philippine Constabulary to seize all hoarded rice. This dramatic move and the glaring newspaper headlines about the rice crisis caused a mad scramble for the already lean supply of rice, and the absence of rice at most corner stores almost resulted in riots. That was a calamity for the country and we do not wish it to happen again. Rice underproduction has always been a recurrent problem in our country. It is a multiple paradox. We have the technical know-how which we have lavishly shared with other rice-producing countries and yet our *national average production is one of the lowest in the world.*"[7]

This preoccupation with low production was also shared by another group of technocrats in a memo to the President in 1963:

"On the basis of production efficiency, the case of our rice industry presents a very pathetic picture. The Philippines is not in a stable position to provide the consumption requirements of the rapidly growing population. *Low rice yields* are generally held to be the cause of the situation. While there is urgent need to increase overall agricultural production in the country, this note of urgency is particularly acute in the case of rice because of the pressure of population."[8]

In this same memo, Roxas, *et al.* outlined a new approach to the perennial food problem. They proposed that prime lowland areas suitable for rice cultivation be selected and utilized to produce the rice requirements. This means growing rice in 1.7 rather than in 3.2 million hectares. The usual ingredients of the program were: irrigation, improved varieties, fertilizers, credit, extension, milling, storage, transportation, and marketing services. The projected period of development of the area was 10 to 15 years and at the rate of 60 cavans per hectare yield, by 1976 the production was expected to exceed requirements.[9]

Such programs are, of course, always simpler on paper (the proponents described the new approach as "startling in its simplicity") than in practice. Somehow no one includes in his projections the fact of typhoons, droughts and floods, diseases, rats, etc., not to mention the infinite variety of problems en-

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[7]D. L. Umali, The Rice Dilemma: Its Causes, Effects and Suggested Remedies. Paper read at the National Science and Technology Week, National Science Development Board, Nov. 21, 1961.

[8]S. K. Roxas, Benjamin Gozon and J. Y. Feliciano, Memo to the President, Subject: Rice and Corn Authority, July 31, 1963.

[9]Roxas, et al., *op. cit.*

countered in getting things done. There is no question that self-sufficiency in rice has been the goal of every administration regardless of which political party is in power.[10]

On February 20, 1968, on the occasion of the Second International Conference on War on Hunger which was called by the Committee on the World Food Crisis, Inc., the Philippines received an award for its efforts toward self-sufficiency. Umali, who as Undersecretary of the Department of Agriculture and Natural Resources received the award, displayed an outburst of national pride when he gave credit to the Filipino farmers whose "accomplishment has exceeded everybody's expectations." He said that "under similar circumstances of scarce and costly production materials, stringent working conditions and lack of incentives as had existed in the past, other people might find it difficult to beat the Filipino's record." Umali's report to the conference mentioned that the 1968 rice production was estimated to exceed our requirements for food for the same period. He likewise indicated that with the carry-over stocks plus some late-arrival imports ordered prior to July 1967, surplus rice stocks of about 475,800 metric tons were expected by June 30, 1968.[11] In other quarters, the role of the Philippines in the world rice output was lauded. This represented a rare opportunity in a century to celebrate "self-sufficiency in rice." But the reason for this celebration was rather short-lived. By 1971 the old story of shortage and importation returned despite reports from the National Food and Agriculture Council about bumper harvest and efforts of dealers and millers to create an artificial rice shortage.[12]

By August 1971, the rice shortage was acknowledged and attributed to 21 typhoons, the Muslim-Christian conflict in Cotabato which had cut heavily into the production of rice and corn, lack of agricultural credit, inability of the Rice and Corn Administration to guarantee a floor support price for rice, and damage brought about by *tungro* disease.[13]

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[10] G. T. Castillo, Miracle Rice as Produced by the Press. Presented at the International Seminar on Communications, U.P., Quezon City, Nov. 13-Dec. 2, 1967.

[11] D. L. Umali, "The Philippine War on Hunger," Second International Conference on War on Hunger called by the Committee on the World Food Crisis, Inc., Feb. 20, 1968, Washington, D.C.

[12] Amado P. Macasaet, NFAC reports bumper harvest: Shortage blamed on millers, *Sunday Times,* Mar. 7, 1971, p. 16.

[13] Arturo R. Tanco, Rice Report: Harvests Way Below Targets, Aug. 20, 1971, *Manila Times,* pp. 1 and 8. A. R. Tanco, Rice Report: Shortage Blamed on Typhoons, Aug. 21, 1971, *Manila Times,* pp. 1 and 8.

If the Filipino could play God in order to intervene in the rice situation, he would want a high price for the rice producer and a low price for the consumer. One of the most important studies done on farmer's response to price change was reported in 1965 by Mangahas, Recto and Ruttan who concluded that:

"Philippine rice and corn farmers are reasonably responsive to changes in the price of rice and corn relative to each other and to other commodities even in the short run. This implies that changes in relative prices are effective in determining the allocation of land among the several agricultural commodities. It seems quite clear, for example, that the declining price of rice relative to corn during the period prior to 1959-60 was associated with the more rapid increase in the hectarage devoted to both rice and corn and the rise in commercial crop area is clearly related to the rapid increase in the price of sugar and copra relative to rice and corn.

"It also indicates that price support, subsidy or import programs undertaken with other objectives, to reduce prices to consumers, for example, are rather rapidly reflected in shifts in production. The analysis of marketing margins indicates that price changes at one level of the marketing system are typically reflected rather rapidly, and with little changes in the marketing margin at other levels.

"While prices of rice and corn in the Philippines have apparently been fairly efficient in their resource allocation function, there is little evidence to indicate that price changes represent an effective device for influencing aggregate agricultural output. In spite of micro-economic evidence that prices represent an important incentive for the purchase of yield-increasing technical inputs (fertilizers, insecticides, etc.), no measurable yield response to price was obtained. Thus while a 10 percent rise in the price of rice will result in at least a 5 percent rise in the marketable surplus of rice, most of the increase in output is a result of shifting land from other crops to rice or bringing new land into production. This implies a much less optimistic role for price as a development tool than if price changes induced yield as well as hectarage changes."[14]

At about the same time, a study of 57 rice farmers in one village after the passage of the bill for the price support program of the Philippine government revealed that only one-half or 29 of them had

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[14]Mahar Mangahas, Aida E. Recto and V. W. Ruttan, Market Relationships for Rice and Corn in the Philippines. Paper presented at the First World Congress of the Economic Society, Rome, Sept. 9-14, 1966.

heard about price support and 27 of them planned to increase their yield in order to increase income. When asked in what ways they plan to increase yield, 19 respondents mentioned the adoption of modern rice-growing practices, 2 said increase of hectarage and 7 planned to do both.[15] Although this is a very small study, it points out that response to price may not necessarily mean response to price support and, therefore, the use of the latter in order to induce productivity increases may not bring expected results. It is likewise important to mention that in all of the village-level studies of the rice farmer, price has never been cited as an important problem they are faced with. Majority of the problems enumerated centered on production. A number of explanations for the lack of preoccupation with price as a problem may be offered: (a) the farmer's disposal of rice is tied up very much to credit arrangements; (b) much of the farmer's rice supply is used for consumption; (c) the Philippines has never really experienced an oversupply of rice so as to really depress prices due to overproduction; (d) rice farmers have never been effectively organized as a significant lobbying force, and therefore agitation for price support has not come from them; and (e) rice farmers have perhaps not been the real recipient of whatever benefits were supposed to be derived from price support or high rice prices because their crop is more often than not, pledged to their source of credit who usually dictates the price. So far, the only situation where price has been mentioned as one of the considerations is in the choice of rice variety to plant. However, yield potential outweighs all other reasons for variety preference.

Unlike the rice farmer, the consumer (and more specifically the urban consumer) has always been able to make his preference for low rice price effectively known. This effectiveness is considerably enhanced around election time. As a matter of fact, the panic associated with rice shortage and the pressure for importation is almost always dictated by the demands of this particular sector of our population. As Mangahas describes it:

> "In 1971 we experienced another rice crisis. Like our previous crisis, the retail price of rice had risen to a very high level and the urban consumer complained. The urban newspapers, radio, and TV played their usual role and complained too with more or less eloquence. Of course all factions of the political opposition whether conservative, reformist or

[15]Unpublished data from C.M. Dimaano and A.M. de Guzman gathered in connection with a study of rice farmers' response to a change in cropping pattern. Farm and Home Development Office, University of the Phil., College of Agriculture, 1965.

radical complained also through speeches, telecasts and writing. They aired their complaints where they felt they would be most appreciated and most effective: in Metropolitan Manila and other urban centers. It seems clear from this that the long-range objective of the Philippines with respect to rice is a level of security and contentment, somehow defined, for the rice *consumer,* especially the *urban rice consumer.* This holds for past and present leadership and in all likelihood will hold for future leadership – whatever political leaning may be the source – as well."

Contrary to the urban consumer's complaint, Mangahas, taking to account the effect of inflation, presents evidence that from 1967 to 1970, "the price of rice has risen much more slowly than have prices of other commodities so that the real price of rice or its cost in terms of other commodities has indeed fallen over 1967-1970 and risen again only in 1971" (Table 1.4).

As Mangahas explains, "the real or deflated price of rice is determined by real supply and demand conditions. If there were no growth in supply from either production or imports, then the annual growth in demand mainly population based, would push the real price upwards; the annual growth in production counteracts this. The decline in the real rice price over 1967-1970 followed by the increase in 1971, thus reflects a net improvement in supplies available over the past 5 years except for the last year." Among the causes of the real supply problem in 1971 cited were: (a) Typhoon "Yoling"

Table 1.4. The mean price of rice in Greater Manila, nominal and deflated, 1967-1971.

	Price of rice in Greater Manila (Macan ordinario) (pesos per ganta)	*Price of rice deflated by consumer price index, Greater Manila (pesos per ganta)*
1967 Simple Mean	1.71	1.272
1968	1.74	1.266
1969	1.65	1.189
1970	1.96	1.185
1971	2.71	1.406

Source: M. Mangahas, *op. cit.*

which came Nov. 1970 in the midst of the main harvest; (b) the *tungro* virus disease which affected the 1970 and 1971 crops as a consequence of which the Bureau of Agricultural Economics estimated the production in Central Luzon for crop-year 1971/72 to drop by 10 million cavans or 30 percent from the 1970-71 production; (c) unfavorable peace and order conditions in Cotabato which is a large rice-producing province in Mindanao; (d) slow down of the flow of credit to the rice sector such that production loans for rice from commercial, rural and development banks which were at their peak in 1967 (about ₱651 million) declined to ₱550 million per year during 1968-1970 and then showed some recovery in 1971 (₱605 million); and (e) the peso devaluation which resulted in the increase of prices of fertilizers and chemicals as illustrated by the cost of nitrogen from ammonium sulphate and urea which rose by about 40 to 50 percent. Despite these setbacks, Mangahas sees two encouraging notes in the rapid adoption of HYV's and the shift from tungro-susceptible to tungro-resistant HYV's and the progress of irrigation from 31 percent in 1963-65 to 42 percent in 1968-70.[16]

Contrary to the Mangahas and Tanco explanations for the rice shortage in 1971, Feuer and Resma attempted to put forth a new angle to the rice situation. As they explained it: "Although losses from typhoons, peace and order, tungro (late 1971) and decreased use of fertilizers and chemicals have slowed the increase in production, yet the increase in production of 1970-71 was 9 percent greater than that of 1969-70 (124 million cavans against 113 million). In contrast during the same period, the consumption of rice per capita increased by about 24 percent, 87 kilos to an average of 108 kg. In view of the foregoing, it appears that the sharp increase in consumption of rice because of changing economic conditions is the major reason for the current rice shortage in the Philippines and not the lack of production which has been increasing at a satisfactory rate consistent with population increase."[17]

Among the evidences cited by the authors to support their conclusion were: the 1969 average rice consumption figures per capita released by the National Economic Council which was 87 kilos; and an article from November 7, 1971 issue of the Manila

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[16]Mahar Mangahas, Philippine Rice Policy Reconsidered in Terms of Urban Bias, Proceedings of the symposium *Toward More Progressive Barrios*, University of the Philippines at Los Baños, April 17 and 18,1972, pp. 2-35.

[17]R. Feuer and P. W. Resma, Progress in the Adoption of High-Yielding Varieties of Rice in the Philippines. IRRI Thursday Seminar, Jan. 27, 1972.

Chronicle which set the approximate consumption figure at 90 kilos. The most important evidences cited were the results of two cereal consumption surveys reported by Aragon and Darrah.[18] These two surveys which were conducted in October-November, 1970 and in May-June, 1971 showed that the average annual per capita rice consumption was about 10 percent larger in the second period (increase was from 102 kg to 113 kg) when the rice and corn price ratio was about 10 percent lower. The authors underscored the fact that the first survey was conducted *before* the increase in the retail price of rice which took place during the December 1970 and January 1971 period. The second survey was taken *after* the retail price of rice had risen considerably. In the interval between surveys, the price of corn which is ordinarily half the price of rice increased considerably such that in 1971 rice cost only 40 percent instead of 50 percent more than corn and, therefore, Feuer and Resma speculated that this substitution of rice for corn must have partially contributed to the increase in rice consumption. Because corn-eaters comprise only 20 percent of the country's population,[19] whatever shifts took place would not be of such magnitude as to substantially contribute to the 1971 crisis. But of greater significance is the reported increase in consumption[20] on the basis of the Aragon-Darrah survey results and the validity of the conclusion that the major reason for the 1971 rice shortage was increase in consumption and not lack of production. For two major reasons, the validity of this conclusion is open to question:

(1) It assumes accuracy of rice production figures which were cited by Feuer and Resma. Tables 1.5 and 1.6 show discrepancies in the statistics coming from two different sources. In both tables, whether in terms of regional yield averages or yields by specific rice varieties, the figures coming from the National Food and Agriculture Council were considerably higher than those from the Bureau of

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[18] C. T. Aragon and L. B. Darrah, "Cereal Concumption Patterns," Dept. of Agricultural Economics, U.P. College of Agriculture. Staff Paper Series 115, Nov., 1971.

[19] Inter-University Steering Committee for Agribusiness Programs. Project Cornelius: Cases and Notes on the Corn Industry in the Philippines, Manila, May 1970.

[20] F. H. Golay and M. E. Goodstein in their *Philippine Rice Needs to 1990: Output and Input Requirements,* AID, Manila, Summer 1967, say that their "confidence in the projections of rice requirements in 1990 derives from the remarkable stability in per capita *direct consumption* of milled rice by Filipinos since 1910 . . . Annual per capita absorption of milled rice has fluctuated rather closely around 83 kg. since 1910 with some evidence of a declining trend." Leon Mears, cited by Mangahas, *op. cit.*, estimated that annual per capita availability from 1954-55 to 1969-70 have a peak of 96.2 kg. in 1969-70 and in 12 out of 15 years it was less than 90 kg.

Table 1.5. Yield per hectare figures from two data sources irrigated-HYV, 1970-71.

	National Food and Agric. Council Data	*Bureau of Agric. Economics, DANR Data*	
	All HYV	*IR-Series*	*C-Series*
Region I: Ilocos		45.80	56.03
Ilocos Norte	87.07		
Ilocos Sur	96.60		
La Union	73.87		
Pangasinan	63.11		
Region II: Cagayan Valley		42.25	49.40
Cagayan	47.74		
Isabela	75.85		
Nueva Vizcaya	68.86		
Region III: Southern Tagalog		48.91	57.90
Batangas	73.90		
Cavite	70.68		
Laguna	71.70		
Mindoro Occ.	71.39		
Mindoro Or.	60.83		
Rizal	57.34		
Quezon	70.32		
Region IV: Bicol		52.56	48.04
Albay	64.73		
Camarines Norte	46.68		
Camarines Sur	37.38		
Region V: Western Visayas		47.00	34.40
Aklan	47.87		
Antique	61.00		
Capiz	66.38		
Iloilo	72.79		
Negros Occ.	76.30		
Region VI: Eastern Visayas		35.50	47.65
Bohol	70.73		
Leyte	74.22		
Leyte del Sur	71.48		
Negros Or.	52.59		
Region VII: Northern and Eastern Mindanao		50.00	43.52
Misamis Occ.	71.39		
Zamboanga del Norte	43.33		

Table 1.5 (Continued)

	National Food and Agric. Council Data	*Bureau of Agric. Economics, DANR Data*	
	All HYV	*IR-Series*	*C-Series*
Zamboanga del Sur	64.54		
Region VIII: Southern and Western Mindanao		44.60	39.40
South Cotabato	98.49		
Cotabato	85.29		
Davao del Norte	45.58		
Davao del Sur	78.38		
Region IX:			
Lanao del Sur	76.25		
Misamis Or.	88.06		
Bukidnon	100.15		
Surigao del Sur	41.44		
Region X: Central Luzon		59.48	50.80
Bataan	59.03		
Bulacan	66.09		
Nueva Ecija	58.82		
Pampanga	62.08		
Tarlac	76.71		
Zambales	65.17		

NFAC data were obtained from D.F. Panganiban, *op. cit.*

Agricultural Economics. The latter employs a system which uses statistical sampling procedures with some changes in percentage of sampling from one year to another. The NFAC system is a monthly compilation of data by each Agricultural Productivity Commission extension worker from the area of his assignment which is summarized by municipality and province and the provincial summaries are then sent to the national office for compiling a national summary which is then transmitted to NFAC.[21] From the NFAC data on 1970-71 a total of 1,050,040 hectares were planted to HYV of which 926,039 were irrigated. In these programmed areas, there were 1,858 farm management technicians (FMT) assigned.[22]

[21] R. Feuer and P.W. Resma, *op. cit.*

[22] D. F. Panganiban, Rice Production Programme. Paper presented at the First ASEAN Seminar on Food Production, Oct. 20-22, 1971, Manila.

Table 1.6. National average yields of HYV's from NFAC-APC programmed areas.*

Crop Year	*IR Series*	*BPI Series*	*C Series*	*Total average yield*
		cavans per hectare		
1967-68	81	62	82	75
1968-69	75	61	72	72
1969-70	72	58	69	69
1970-71	67	59	66	66
July-Dec. 1971	69	61	63	67

Yield figures from the Bureau of Agricultural Economics, Department of Agriculture and Natural Resources

	IR Series		*BPI Series*		*C Series*	
	Irrig.	*Non-Irrig.*	*Irrig.*	*Non-Irrig.*	*Irrig.*	*Non-Irrig.*
1970-71	48.92	34.86	52.87	31.35	48.67	31.08
Percent of area devoted to HYV	49	27	3	7	10	5

*From: R. Feuer and P. W. Resma, *op. cit.*

This means an average of 565 per FMT for the entire HYV area and an average of 493 hectares if they were concentrating on the irrigated areas. If no systematic sampling is applied, the task of collecting and compiling production figures is a formidable one, not to mention the other responsibilities of the FMT.

Crisostomo and Barker remarked in their paper that a separate set of government statistics on rice released by NFAC is at variance with the findings they have. In October 1971, NFAC reported that yields of HYV continue to average about double that of the traditional varieties. If these estimates were accurate, Crisostomo and Barker think the Philippines would be exporting large surpluses of rice instead of importing in 1971.

(2) It assumes that rice consumption figures reported in the consumption surveys represent *actual* consumption. An examination

of the interview schedule used in the survey indicated that the question asked of the respondent was *amount* of rice *bought* and not amount actually consumed or used although the research report mentioned *rate of use* or rate of *cereal consumption* throughout. The assumption is that what is purchased is consumed for the week in question. For perishables, this assumption may be warranted but for rice which can be stored, this assumption that what is purchased is also consumed for the week is not necessarily valid. This is more questionable under conditions of increasing rice prices and knowing fully well how Filipinos respond to such a situation involving the supply of our most important staple food. Furthermore, their 1,000 respondents came from cities and municipalities with average family incomes of ₱6,882 in 1970 and ₱7,551 in 1971. These urban and urbanizing respondents are the people most exposed to news about impending rice shortages and their effects on rice prices. They are also the people capable of increased purchases for the purpose of hoarding rice for the household.

In the light of the question asked of the respondent which was *amount bought* and not amount actually used or consumed and in view of the circumstances obtaining at the time of the survey, the reported increase in rice consumption from 1970 to 1971 is a "hoarding reaction" to the threat of rice shortage and rising prices. A few captions of the news items preceding the second survey will give us an idea of the prevailing atmosphere during that period:

March 14, 1971 *Manila Times*

"FM halts rice import moves"

"Price Control Council urged to enforce rice price"

April 13, 1971, *Manila Times*

"NEC assesses rice shortage. May reach 5.5 million cavans"

"The reality of a rice shortage must be faced"

April 14, 1971 *Manila Times*

"Jap aid due tomorrow – 50,000 tons from Taiwan and 10,000 from Japan

April 17, 1971 *Manila Times*

"Shortage certifies in NEC resolution, 110,000 MT"

April 29, 1971 *Manila Times*

"No more stocks after June 7? By the administration's most conservative estimate, the country has only about 34 days supply in its rice bin as of March 31. With the importation of 110,000 MT the rice bin would be filled

with 12 more days supply. This means the country will run out of rice by June 7, 1971."

With constant bombardment of these news from all the media added to the reality of increasing rice prices, how many housewives can afford to ignore the desire to purchase more rice in order to insure the household supply?

To illustrate the effect of all the adverse publicity on hoarding propensity and rising price, 52 percent of the imported rice which arrived during the pre-election period of 1971 was distributed in the Greater Manila area and yet the price in the city continued to rise in October and declined only slightly in November. Considering that the Rice and Corn Administration distributed in the area 12,000 tons in September, 33,000 tons in October, 30,000 tons in the first half of November and that Greater Manila consumes roughly about 30,000 MT per month, and that this requirement was already matched by the RCA alone, excluding rice supply from other sources, a decline in price would have been expected. During that very same period there seemed to be an extraordinary increase in demand for rice.[23] It is unlikely that people eat more rice around election time. It seems much more plausible that the increase in amounts purchased was due to a desire to hoard supply as a cushion against further shortage and rising prices. Ironically, the very act of hoarding triggers the rise in prices.

In summary, the Philippine rice situation can be characterized as a century of very low productivity levels and of recurring shortages, importations and annual crises except for the years 1962-1970 when there was no rice crises, no imports and, hence, "self-sufficiency" was supposed to have been attained. However, "some left-over stocks from the 1967 importations were used up during this period." Mangahas points out that "the presence of imports during a year does not necessarily imply that the country is *not* self-sufficient in rice for the year. It simply implies that the government *thinks* we are not . . . The crux of the matter is that we have never allowed the market to indicate how much in imports the country needs. The government by law monopolizes the international trade in rice and is forced to decide whether or not to import or export, and if so, by how much." What needs to be emphasized is Mangahas' assessment of *Philippine society's conception of self-sufficiency* — i.e., *the absence of imported rice under*

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[23]M. Mangahas, *op. cit.*

conditions of "reasonably" low prices. And the pressure for low rice prices comes mainly from the urban sector.

Just like that of Mangahas, the projections made by Golay and Goodstein on the ability of the Philippines to meet future rice requirements are based on the potentials offered by the new high-yielding varieties in conjunction with improvements in irrigation. The other factors identified as "going for" the Philippines are the farmers' rapid adoption of the new rice technology and the "vigorous private sector" which Golay and Goodstein think can be depended upon "to bring into existence the marketing, milling, warehousing and transportation facilities at rates which will not impede the necessary expansion in aggregate rice availability." Mangahas likewise feels that a rice subsidy is not needed at this time in order to enable rice farmers to modernize faster. Their fast rate of acceptance of HYV gives us some confidence that farmer conservatism is not going to be an obstacle. He also believes that the "real test of self-sufficiency will be prices that urban consumers consider reasonable, without imports, and without restrictions on imports by the private sector." He, too, has confidence in the private sector's ability to respond to the country's export and import needs for rice.

2

The Introduction, Diffusion and Adoption of the New Rice Technology

A. An Introduction to the Rice Farmer as a Potential Recipient of New Technology

To the Pilipino, rice is not just a cereal grain. It is life three times a day; it is politics every lean month of the year; it means security for those who have it and for those who do not, much of livelihood is aimed at it. Those who do not produce it, earn money to purchase it. When the common *tao* (common man) or the *magsasaka* (farmer) is mentioned, this has reference to the rice farmer standing behind the carabao and his plow, with a dilapidated nipa hut in the background. The picture is always one of poverty and hard manual work written all over his face and his hands. This stereotype of the Filipino farmer as a rice farmer has a factual basis. Whether it is reckoned in terms of hectares devoted to the crop or in terms of number of people employed in specific agricultural industries, rice (3.1 million hectares) and corn farming (2.1 million hectares) leads all other types of farming (Tables 2.1 and 2.2). The 1968 data on hectares devoted to coconuts show 1.8 million hectares; as of 1971, the sugar area is 406,137 hectares. Of the total number of persons employed in agriculture, hunting and fishing, 68 percent of the 7.2 million are in rice and corn farming. Of the total males in agriculture (5,339,000) as of 1968, about 66.3 percent are engaged in rice and corn farming and of the total females (1,863,000) in agriculture, 73.1 percent are in the same category.

Despite the importance which rice farming occupies in the economic and political life of the country, it has never been a glamorous occupation. On the contrary, it has always been associated with poverty and backbreaking work. As the old Filipino folk song goes:

> "Planting rice is never fun
> Bent from morn till the set of sun
> Cannot stand and cannot sit,
> Cannot rest for a little bit."

Table 2.1. Land utilization by kind of crops (in thousand hectares, crop-year 1966.

Food crops	*Hectares (in thousand)*
1. Rice	3,109.2
2. Corn	2,106.1
3. Fruits and nuts, except citrus	353.0
4. Citrus	28.5
5. Root crops	262.8
6. Vegetables, except onions and potatoes	47.0
7. Onions	5.2
8. Irish potatoes	2.5
9. Beans and peas	54.9
10. Coffee	43.7
11. Peanuts	25.8
12. Cacao	9.4
13. All other food crops	11.7
Total	6,061.83

Source: Department of Agriculture and Natural Resources, Bureau of Agricultural Economics.

Table 2.2. Percent distribution of employed persons in specific industries of agriculture. (May 1968 Bureau of Census and Statistics Survey of Households)

Industries	
Total employed in agriculture, forestry, hunting and fishing	7,202,000
	Percent
1. Rice and corn farming	68.1
2. Coconut farming	8.5
3. Sugar-cane farming	4.1
4. Abaca and other fibers farming	1.1
5. Tobacco farming	1.9
6. Other crops, horticulture, poultry, livestock production	7.5
7. Products, not specified	0.2
8. Agricultural services (on fee or contract basis) — pest control, irrigation system operation, renting of farm machinery	0.1
9. Hunting and fishing	7.0
10. Forestry, including logging and foresty service	1.7

Side by side with poverty, the rice farmers (particularly tenants) have also been considered as "the non-emerging class of farmers who have been the object of apparently futile efforts aimed at improving their conditions" although admittedly, if Philippine agriculture is to modernize, rice culture and the rice cultivator have a critical role to play.[1]

A number of other social scientists looking at the traditional world of the rice farmer provide us with descriptive accounts of what we might expect from this farmer by way of response to new technology. Covar's study of the Masagana/Margate system of rice cultivation gives us an excellent start, particularly because it was conducted more than 12 years ago in the province of Laguna. The rice cultivation system includes the nine steps usually followed by Filipino farmers but carried out in the more careful and intensive operations. Covar's prognosis of the system's prospect for adoption is as follows:

> "The Masagana / Margate system is a product of specialists or experts in agriculture. The older method, on the other hand, has been polished and hallowed by tradition and experience. The gap between the new and the traditional is large enough to create a situation whereby the new can be misunderstood. Furthermore, the relationship between those who are introducing and those who are going to accept the innovation is not on an equal plane in terms of age, education, and other socio-cultural factors. It may be assumed that there are socio-cultural barriers, such as respect for old age and farming experience, which very much affect acceptance.
>
> "The farmers accept only within the framework of their viewpoint as conditioned by their experience. Thus their readiness to accept is definitely limited. In connection with this, there should be an identification of a need, and the meeting of such a felt need should be the basis of any program of community development. Do the farmers feel a need for the Masagana/Margate system? Again the farmers respond only within the limits of their training, experience and understanding . . . A case which seems to be relevant is cited as an analogy. If, for instance, a beautiful pamphlet is given to a primary grader, and his response is recorded, one would notice that the pupil will only scan the pages and then put it aside. The case is identical to that of the farmers. They have been given pamphlets with instructions for a new way of planting rice. However, they

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[1]Louis H. Douglas, Fifty Farmers of Gapan: The Propensity To Develop in One Rural Philippine Situation. Kansas State University, Spring 1966 (mimeo 46 pp.)

only become interested in looking at the pictures, never applying what they have seen and read."[2]

Covar's prognosis is worth remembering in view of later developments in the same area where his study was conducted. Jocano's study of economic development and cultural change in a Visayas barrio which describes the rice farmer in his own world is prefaced by a note of caution:

> "... To talk about acceptance of modern technology in terms of demonstrating its economic advantages is to be naive about the dynamics of human study. One needs to view acceptance in terms of the meanings people have of economic advantages ....."

Jocano then describes the Malitbog farmer's reaction to leasehold arrangement, cooperative labor and scientific farming practices:

> "... The rental is fixed and risks are borne by the lessee alone. When farming is dependent only on the vagaries of an uncontrolled natural environment, these risks are indeed great. This unpredictability of nature is one of the major elements in Malitbog's general ecology that wields an overriding influence on local agricultural activities ... In a word, lack of technological control over nature, like irrigation, makes farming a gamble. It is thus understandable why the farmers do not appreciate the value of risk in agricultural management or on-the-spot decision-making in any agricultural activity. On the other hand, they have learned to be slow in their actions and have developed elaborate planting, caring, and harvesting rituals to help them determine and control the behavior of nature. One miscalculation means dislocation of the annual economic income which is in any event very small. Moreover, credit is difficult to obtain, and if it is available the interest is indeed exorbitant ...
>
> "... Farming is a nuclear family affair with members as the basic working unit. This does not mean that other forms of cooperative labor are ruled out in the process but that full cooperation of an extended household in the production of stable food or of any crop is relatively rare. They help one another in many agricultural endeavors – like plowing and transplanting, but they cultivate different fields and feel solely responsible only for their own fields. There are cooperative labor patterns in the barrio which involve the participation of non-kin...
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> "... Other factors which need to be considered in talking about land use and production in Malitbog are the financial resources of the people

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[2]Prospero R. Covar, The Masagana/Margate System of Planting Rice: A Study of An Agricultural Innovation, Study Series No. 5. University of the Philippines, Community Development Research Council, 1960.

and the market prices of crops they produce. Given the chance, farmers would prefer scientific farming over the traditional because they are aware that it would bring better harvests. However, they are also aware that acceptance of modern technology would entail more expense than they could afford. Fertilizer and insecticides are needed. Measured spacing during transplanting is time-consuming and labor-demanding. The seeds have to be selected. All of these have to be purchased in addition to labor expenses which have also to be met. Thus the limited financial resources of the farmers at the beginning of the planting season prevent them from accepting modern farming as the means of resolving their economic problem . . . this pressure of limited economic opportunities has led to conservation in outlook and preferences for traditional methods in farming in that tried ways are more assuring and more predictable than new alternatives which have greater elements of risk that the farmers are not quite prepared to take.

"Not only do financial resources but also the possible market price of the crops enter into this pattern of decision-making at the beginning of the planting season. Prices of crops planted, harvested and sold during the previous years are reviewed and the lower-priced crops are avoided. For example, when the wholesaler in the town in 1964 lowered the price of new varieties of rice – Manila rice, BE-3, etc. because of poor milling return, the farmers did not plant these varieties in 1965. In the nearby barrio of Igsuli, there was a rush of sugar-cane cropping in 1963-64 because the price of sugar went up in 1962. In fact, many ricefields were converted into cane fields . . .

"Rituals, prayers and other ceremonies are performed during the planting and harvesting seasons in order to hasten the growth of rice, to ward off evil spirits from the field and to insure a good harvest. The observance of these rituals follows the agricultural cycle.

"In emphasizing the significance of rituals and sympathetic magic on the economic activities and social behavior of the people, I do not imply that they are not aware of scientific, tested methods of farming. They know that when commercial fertilizers are used, their crops will give them a rewarding yield. They also know that they have to take good care of their fields if they expect to have a good harvest. It is only within the realm of recurrent events in which their technological knowledge cannot effectively operate that rituals are used. The farmers are aware that there are certain culturally sanctioned ways of reinforcing their agricultural knowledge. The use of sympathetic magic is an important one. As one of the farmers reasoned: 'I lose nothing if it does not work; I have everything to gain if it does! ' "[3]

[3]F. Landa Jocano, The Traditional World of Malitbog: An Anthropological Study of Economic Development and Cultural Change in a Philippine Barrio. University of the Philippines, Community Development Research Council, 1967.

What is particularly noticeable about the preceding description is that it appears to contradict the very caution the author prefaced the description with. From the details cited, it is quite evident that the rice farmers were behaving rationally in response to the economic resources and institutions surrounding them . . . Even magic and rituals were resorted to as a form of additional insurance under conditions of greater uncertainty.

Another social scientist writes a short story to illustrate how "cultural set" affects response to new rice technology:

"The manager of a large commercial farm in Mindanao explained to his workers how he wished to plant and cultivate rice through the use of modern techniques. After two days of this kind of work all the men came to his office and tried to quit.

"Why? " he asked.

"Because we are ashamed to plant rice this way. We feel slow and awkward. People are watching us and laughing at us behind our backs. We have always been considered good workers up to now. We have good reputations to protect! "

By strenuous argumentation and promises of certain fringe benefits, the manager persuaded most to continue. They went reluctantly back to work. But a few weeks later they returned to draw their pay and quit.

"Now what's the trouble? " inquired the manager.

"The new way of weeding, sir, will not be successful. The rice will fail. We do not wish to be connected with the project."

Again, the manager was able to persuade most to continue and they went reluctantly back to work. After five months, the harvest came and the manager reaped approximately 100 cavans of rice per hectare, more than three times the usual crop. But if a development team had been working with individual small-scale farmers, it would have been difficult to persuade these farmers to begin, and even more difficult to get them to continue to plant and cultivate their rice through this technique.[4]

These preceding three accounts, although attempting to show potential socio-cultural sources of resistance to or rejection of new rice technology, wittingly illustrate how such resistance might be overcome. Almost a century of recurring rice shortages and low levels of productivity and not too optimistic assessments of the rice

[4]Francis C. Madigar, Comment on "Some Missing Variables in Diffusion Research and Innovation Strategy." ADC Reprint, March, 1968, The Agricultural Development Council, Inc. N. Y.

farmer's capacity to innovate have been presented. This chapter now discusses the introduction, communication and adoption of the new rice technology.

B. The Introduction of New High-Yielding Varieties

Although improved rice varieties were previously developed and introduced in the Philippines, there had not been any significant change in yield potential and no general widespread adoption of any of these varieties. As a matter of fact, in tropical Asia, the average rice yields were about 1.5 metric tons (34 cavans) per hectare – and have been so for a long, long time. On the other hand, Japan's national rice yields were two, three or four times higher. For a while low yields were attributed to low levels of fertilizer application by the tropical rice farmer. But unfortunately, increasing the rate of fertilizer use did not increase yields. They even depressed yields. The rice scientists subsequently identified the problem as one of a tropical rice plant which is tall and has droopy leaves – very susceptible to falling over in heavy rain or high winds. This propensity to fall over or lodge prevents the rice plants from effectively utilizing sunlight in order to fill up its grains, hence yields tend to be low; when this traditional rice plant is treated with high rates of nitrogen, it grows taller and droops even more, hence further yield reduction results.[5]

The search for and development of a new plant type for tropical Asia became, therefore, one of the most important missions of a highly specialized rice research institute.

When in 1961 the ultra-modern facilities of the International Rice Research Institute (IRRI) rose from *Higamot Hill* which was once a rustic area planted to coconuts, citrus, banana and pineapples, a well-known Filipino educator said: "Somehow I find it difficult to see the connection between this 20th century Institute and the man who plants rice." While everyone appreciated the air conditioning, the wooden panels, the murals on the wall, the automatic icemaker and even the petite bearers of pulchritude who walk around its spotless corridors, there was at that time some skepticism as to what IRRI could do about the traditional problems of a traditional crop.

Bearing in mind the architecture of the new rice plant tailored for the tropics, the IRRI rice breeders found in Taiwan a tropical semi-dwarf variety called Taichung Native I whose short stature came

[5]Steve A. Breth, IR-8 and Beyond. IRRI, Los Baños, Laguna, Philippines.

from a variety called Dee-geo-woo-gen. In 1962, there were 38 crosses made, one-third of which involved Dee-geo-woo-gen or its close relative I-geo-tze. One of these crosses was between Peta, a traditional Indonesian variety with good insect and disease resistance, and Dee-geo-woo-gen. After three years, an experimental variety selected from this cross produced a computed yield of 6.6 metric tons (about 150 cavans) per hectare. This variety which was named IR-8 a year later is short (about 100 cm. compared to the typical 160 cm.), stiff-strawed, has upright leaves, is high tillering, non-photoperiod sensitive, resistant to several insects and diseases and short-maturing (120 days as against 140 to 160 for traditional varieties). There was a rationale for all of these "traits" which were built into the new rice plant.

"Breeders selected and propagated plants that had upright leaves because IRRI's plant physiologists told them that upright leaves would intercept sunlight more efficiently than droopy leaves. High tillering capacity is a biological form of yield insurance. It means that the plant has the ability to put out extra shoots if the field is transplanted too sparsely or if neighboring plants die. Insensitivity to photoperiod means that the variety will mature in the same number of weeks regardless of the length of day. Sensitive varieties may not mature, or even flower, if grown in an area or season with a long-day-length. Insect and disease resistance reduces the amount of pesticides necessary to get good yields."[6] The reduction in the length of the growing period of the rice plant will enable the farmer to increase the cropping intensity in the same piece of land. Furthermore, it will reduce by 20 to 40 days the period when the rice plant would be subjected to pests, diseases, and vagaries of the weather.

With the production of its initial seeds, the IRRI turned over to the Philippine government 50 tons of IR-8 seed. This represents the first available supply of such seeds outside of experimental plots. In addition to the 50 tons, IRRI itself distributed the remaining 5 tons in two-kilogram packages to the first 2,359 farmers to request such seed in person at the Institute. The IRRI-distributed seed was sufficient only for 700 square meters per farmer [7]

Because of the limited supply of IR-8 seeds at the start, seed

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[6]Breth, *op. cit.*

[7]Robert E. Huke and James Duncan, Spatial Aspects of HYV Diffusion, IRRI, Los Baños, Laguna.

multiplication for rapid and widespread distribution was considered urgent. In 1966 the Rice and Corn Production Coordinating Council (RCPCC) set up a special seed multiplication program for IR-8.[8] The 50 tons of seeds were sold by IRRI to the Rice and Corn Administration at ₱25 per cavan for distribution to selected farmers in the areas designated for IR-8 multiplication. Eighty percent of these seeds went to the multiplication areas and 20 percent were planted in the test plots of the Agricultural Productivity Commission and the Bureau of Plant Industry. RCA sold the seeds at cost to authorized seed multipliers. The farmers selected by RCPCC to be its seed cooperators were those who had at least 10 accessible hectares of riceland which were located in the designated areas of multiplication and irrigation facilities. The farmer should also have temporary storage facilities to keep seeds produced before delivery to RCA or to other farmers. In addition, farmer-cooperators signed an agreement with the Council that (1) he will grow the seeds in accordance with recommended cultural practices for seed multiplication; (2) he will allow his farm to be inspected by technicians of the IRRI and the government; (3) he will sell as much of his seed harvest to the Council or the RCA provided the seeds meet prescribed specifications; and (4) he will sell all of his harvest only as seed rice and not for commercial purposes or for human consumption. Ninety-two cooperators were selected for this seed multiplication program.

A study of these cooperators found that following the wet season of 1967 less than 50 percent of the initial crop was sold as seed. Although cooperators expanded their planting of IR-8 during the dry season, an even smaller portion was sold as seed in this season. This suggests that with competition from other sources the seed market was already saturated by the end of 1967 dry season. Thus, within exactly a year of the release of IR-8 seeds from the IRRI, adequate supplies were available to meet local demand. [9]

This would seem to indicate that supply of HYV seeds is not likely to be a bottleneck except during the first season of its production. The available seeds at the local level, however, are not likely to be the so-called *certified seeds* which are supposed to have

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[8]T. V. Mina and F. A. Tiongson, Patterns of Rice Seed Distribution in the Philippines, *Philippine Economic Journal,* No. 14, Second Semester, Vol. 7, No. 2, 1968, pp. 213-223.

[9]Department of Agricultural Economics, Annual Report 1967, IRRI.

been approved by the seedboard with the Bureau of Plant Industry (BPI) as the seed-certifying agency. In order to qualify for certification, several factors are considered: high yield, resistance to lodging, good milling recovery, disease resistance and good eating qualities. On the average, the selection was from 3 to 4 seasons of preliminary yield tests, 2 to 3 seasons of general yield trials and 2 to 3 seasons of regional adaptability tests conducted in different parts of the country. However, for certain varieties that show unusual potential, the time could be greatly reduced. IR-8 was approved in April 1967 after only three seasons of testing in different stations. The government decided that rapid multiplication and distribution was essential if the potential benefits of IR-8 were to be achieved without delay. The RCPCC took a calculated risk in circumventing many of the requirements of the seed certification system in favor of a speedier system of multiplication.[10]

In the light of experiences since 1957 in the production and distribution of certified seeds, this short-cut is not of much consequence. Data on distribution of certified seeds by the BPI from 1960-61 to 1965-66 show that only a very small percent of all seeds required came from certified seeds. The lowest was 0.14 percent in 1960-61; the highest were 0.81 percent in 1962-63 and 0.65 percent in 1965-66.[11] This means that farmers were using all kinds of seeds from their own fields, their neighbors, local seed producers, etc. but hardly from certified sources. A study of 102 farmer-cooperators in Nueva Ecija and 438 in Laguna during the February-June 1966 crop season before IR-8, found that 97 percent of the former and 89 percent of the latter did not use certified seeds despite the fact that they were participants of the intensified rice production program at that time. It is also noteworthy that 38 percent of the Nueva Ecija farmer-cooperators studied and 27 percent of those in Laguna never heard of certified seeds. Furthermore, more than half of them said that certified seeds were not locally available.[12] Lu's study of 395 farmers from 15 barrios of 13 municipalities in 6 provinces of Central and Southern Luzon have essentially the same findings with only 9 percent reporting use of certified seeds. Unawareness of its existence and local unavailability were the two most important

[10]Department of Agricultural Economics, Annual Report, IRRI, *op. cit.*

[11]T. V. Mina and F. A. Tiongson, *op. cit.*

[12]Bureau of Agricultural Economics, Survey of the Pilot Program on Intensified Rice Production, 1966.

reasons for non-use.[13]

Considering that the BPI seed certification and distribution program had been in existence for more than 10 years and yet less than one percent of the total seed requirements of the country as of 1966 was supplied from certified seeds, an assessment of "ineffective" is rather obvious. However, the seedboard performs the legitimizing function as far as which varieties will be multiplied and distributed. So far the HYV's which have been approved and recommended since 1966 are: IR-8 and IR-5 in 1967; and IR-22 and IR-20 in 1969; IR-24 in 1971; BPI-76, C4-137; C4-63 and C4-63G in 1972. The IR varieties were developed by IRRI; BPI by the Bureau of Plant Industry and the C-series by the University of the Philippines College of Agriculture. Because these varieties undergo field trials in different parts of the country before they are officially released, someone always has access to the seeds. Therefore, as long as new seeds are considered desirable from actual or heard of performance, any available supply will be obtained through purchase, barter, request, stealing, etc. whether or not they are certified by the seedboard. This has its dangers, of course, but HYV's are reproducible within four months, hence its spread is impossible to control when news about its desirable qualities leak out. In the advent of problems associated with the seeds such as disease, low price, poor eating quality, low yield, etc., the use of the seeds declines as fast if not faster than its original spread. This has happened with IR-8 whose peak of adoption was reached in 1968 and disappeared soon after that and so did IR-5 mainly because of bad experiences with diseases. The rice scientists are, therefore, constantly on the drawing board trying to design the *near-perfect* seed — the variety which has almost all the positive qualities at least until a new set of problems arise. It is not only the farmers who take risks in trying the new seeds; the scientists, policy-makers, extension workers, and the seedboard all assume calculated risks when they recommend the planting of certain rice varieties.

For a five-year trend in the diffusion and adoption of HYV starting from IR-8, the case study of Gapan, Nueva Ecija[14] is illustrative of the rapidity with which rice farmers have taken to the new technology. Table 2.3 shows that from the 16 original adopters in

[13]Hsueh-Yi Lu, Some Socio-Economic Factors Affecting the Implementation of a Rice Production Program in the Philippines. Unpublished Ph.D. Thesis, University of the Philippines, College of Agriculture, 1968.

[14]R. E. Huke and J. Duncan, *op. cit.*

1966, the new seeds spread to 1,300 farmers with 50 percent of the area and about 59 percent of the farms planted to them by 1969. The ten barrios in the municipality of Gapan differed, however, in the percentage of farms with HYV by 1969. In the three barrios where major portions of the rice land were rainfed, the rates of adoption in 1969 were 41%, 28% and 11% for the remotest and almost completely rainfed barrio. This latter barrio, however, achieved 76 percent adoption by 1971 as reported in Herrera's study.[15] The three barrios where ricelands were almost fully irrigated attained practically 100 percent adoption by 1969, four years after introduction. Other irrigated barrios had more than 80 percent adoption by then. Of the five factors tested for their relationship to the rate of adoption, the most important was percent of farm irrigated. The second factor was continuous settlement or neighbor with the location of the 16 original planters having considerable impact on the patterns of adoption. Percent of farmers who were landowners and percent who were on leasehold were not significantly related to rates of adoption, indicating that tenure status has neither enhanced nor hindered the spread of HYV. Rather, the presence of irrigation and exposure to the HYV experience are better explanations for the rapid spread.

Table 2.3. Adoption rates of HYV in 10 barrios of Gapan, Nueva Ecija, 1966 to 1969.

	1966	*1967*	*1968*	*1969*
Percent of farms planting HYV	0.7	4.2	31.7	58.7
Total No. of farmers (2217)				
Number of new adoptions	16	78	609	597
Grand total of adoptions	16	94	703	1300
Percent of farms with HYV				58.6
Percent of area in HYV				50.9
Total farm area				
6910 hectares				
Area in HYV				
3510 hectares				

Data from R. E. Huke and Duncan, *op. cit.*

[15] R. T. Herrera, Changes in Rice Farming in Gapan, Nueva Ecija. IRRI-U.P. College of Agriculture Research Project, 1972.

Table 2.4. Varieties grown on irrigated two-crop and rainfed farms, Gapan, Nueva Ecija, wet season, 1966 to 1970.

Year	*Number of farms planting*							
	IR-8	*IR-5*	*IR-20*	*C4-63*	*Binato*	*Intan*	*Tjeremas*	*Others*
	— Irrigated Two-Crop —							
1966	2	0	0	0	290	0	0	14
1967	19	2	0	2	288	0	0	7
1968	94	18	0	20	204	0	0	8
1969	58	127	8	88	67	0	0	22
1970	3	67	190	75	8	0	0	26
	— Rainfed paddy —							
1966	0	0	0	0	0	89	33	2
1967	0	0	0	0	0	96	34	2
1968	0	2	0	0	0	99	34	7
1969	9	21	0	11	0	98	36	9
1970	0	47	12	21	0	88	29	17

Source: Agricultural Economics 1971 Annual Report, . . . *op. cit.*

Table 2.4, with data also from Gapan, shows three major trends:

(1) The continuous and rapid decline in the use of traditional varieties like Binato which by 1970 had practically disappeared in the irrigated areas.

(2) The rise and decline of different HYV's. IR-8 had made its exit by 1969 while IR-5 hit its peak then and declined by 1970. IR-5's susceptibility to *tungro* practically led to its demise by 1972. IR-20 and C4-63 have taken over because of better tungro-resistance.

(3) The improved local varieties like Intan and Tjeremas decreased slightly from 1966 to 1970. As was expected, the rainfed areas were later adopters of HYV's. They started with IR-5 and C4 only in 1969 and picked up in 1970.

In general, the life of an HYV in the rice paddy may be bright and active but relatively brief. *Permanence* in *prominence* is not one of its special virtues. Certainly, the time spent in the search, development, and testing of each variety seems much longer than its profitable life in the paddy field. The one variety which seems to have outlasted many others is Intan which is still around despite the

fact that it was introduced from Indonesia by the Bureau of Plant Industry soon after the World War II. Although not a very high yielding variety it has acceptable eating quality and performs well during the dry season when its predisposition to lodge is reduced. In the market it is usually priced as a fine variety.

Rice varieties, unlike human beings, are bred deliberately to incorporate as much as possible whatever qualities are deemed desirable. Each comes out with some degree of individuality, depending upon which of its qualities stand out. In reviewing the IR varieties, IR-8 started a new generation of dwarf, stiff-straw, nitrogen-responsive, high-yielding rice plants although its grain was not as palatable to Asian consumers. IR-5 which followed was not as responsive to nitrogen but was more resistant to drought than IR-8, hence it was also known as the "best upland variety" at the IRRI. Unfortunately, it proved susceptible to the tungro virus. IR-22 and IR-20 have better grain quality than either IR-8 or IR-5 but IR-24 is even better because the grain cooks soft. IR-22 is also susceptible to tungro. IR-20 is resistant to stem borers, blast disease and tungro virus. Moreover, it has a high degree of tolerance to soil disorders such as phosphorus and zinc deficiency and iron toxicity.[16] C4 varieties are noted for their eating quality which is very acceptable to the Filipino taste. They are also resistant to the tungro virus although susceptible to some other diseases. C12, a College variety which was introduced in 1972, is blessed with good eating quality, less shattering, less empty grains and similarly disease and insect resistant as the C4 varieties. Because of all these different characteristics, their life span as favored rice varieties is difficult to predict. There is no one perfect or even near perfect variety for all places and all seasons. The rice scientist is, therefore, the most enduring of all inputs.

Although specific HYV's may come and go, as a category they have very rapidly found their place in the ricefield whether or not it is irrigated. From 22 percent in 1967, the lowland rice area devoted to HYV's increased to 57 percent in 1970-71 with 67 percent irrigated and 45 percent rainfed (Table 2.5). Despite social scientists' prognosis to the contrary, the rate of adoption of the new seeds exceeds the experience reported in the U.S. where it took 8 years for hybrid seed corn to be adopted by 59 percent of Iowa farmers.[17] The pessimism earlier expressed by social scientists

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[16]S. A. Breth, *op, cit.*

[17]Everett M. Rogers, Diffusion of Innovations, *The Free Press,* N.Y. 1962, p. 141.

regarding the acceptability of the HYV's was premised on what was considered as the "Cadillac" nature of the innovation:

"While miracle rice offers tremendous potentiality to our rice crop, to the subsistence farmer it will probably remain a potentiality at least for the immediate future. I believe this to be so because miracle rice requires much input, skills and environmental controls to enable it to perform its miracles and the subsistence farmer has little of these requisites."[18]

Another skeptical note came from the President of the Rice and Corn Producers' Association, who on April 26, 1967 said:

"No miracle seed is necessary, only an honest-to-goodness working irrigation program. Without water, even miracle seeds will not grow. Furthermore, IR-8 needs fertilizers and insecticides which are a burden to the farmer who has no money to invest on these modern aids to agriculture." On August 9, 1967 this very same man said the Philippines would be exporting rice in 3 to 4 years with the introduction of miracle rice. On August 24, 1967, he debunked claims that the bumper harvests reported in Central Luzon were mere publicity stunts. He said: "What was not anticipated was the farmers' response to a wide-scale planting of rice."[19] Although his prediction that the Philippines would be exporting rice in 3 to 4 years from 1967 has not come true and is nowhere in sight, it is a fact that

Table 2.5. Percentages of lowland rice planted to HYV on irrigated and non-irrigated lands in the Philippines, 1967-68 to 1970-71.

(Data from Bureau of Agricultural Economics, Department of Agricultur and Natural Resources)

Crop Year	Percent of Lowland Rice Area in HYV		
	Total	*Irrigated*	*Non-Irrigated*
1967-68	22	33	13
1968-69	41	61.6	28
1969-70	50	61	39
1970-71	57	67	45

Source: Agricultural Economics Annual Report, 1971, IRRI.

[18]Gelia T. Castillo, "A New Look at Old Concepts in Development," *Solidarity,* Vol. 3, No. 5, May, 1968, p. 14.

[19]Gelia T. Castillo, Miracle Rice as "Produced" by the Press, *op. cit.*

HYV's have spread not only quickly but also widely. Furthermore, there was a misconception that IR-8 grown under less than ideal conditions would result in being worse-off than traditional varieties. As the IRRI reported:

> "The existing tall tropical varieties are inherently incapable of high yields even when carefully tended; experimental yields exceeding 5 tons/ha are rare. It so happens, however, that even under normal rough management practices, IR-8 produces at least as well as, and usually considerably better than, the traditional tall and late local varieties. There is no scientific basis for the claim, sometimes made, that farmers who are unable to afford more advanced cultural techniques are better off with the old varieties. What evidence there is seems to indicate that such farmers are at least no worse off with rough farming methods.
>
> "In six dry-season experiments conducted by the Institute – admittedly on a fertile soil – the average yields of IR-8 grown without any fertilizer was 5,300 kg/ha. In the same experiments, the average yield of the highest yielding tall variety from each experiment was 4,500 kg/ha. From similar experiments conducted in the wet season, the mean yields were 4,400 kg/ha for IR-8 and 3,900 kg/ha for the tall varieties. Thus at least in these experiments, IR-8 remained superior even in the absence of fertilizer. The claim that 'IR-8 needs more fertilizer' is therefore false. It needs no more than any other variety but, as we shall see later, it is much more capable of using high levels of fertilizer nitrogen.
>
> "Similarly, in Institute experiments there have been no indications that, in the absence of insect control, IR-8 produces any less than conventional tall varieties. Observations of IR-8 growing on commercial farms, often under conditions far from ideal, support the contention that this variety will yield at least as well as local varieties under imperfect systems of culture. It is not denied that under some conditions, IR-8 will be outyielded. Floating rice areas are one obvious example. Furthermore, a local variety that is highly resistant to a disease or insect pest will be at an advantage in a season of high incidence of such a disease or pest. But, in general, it is wrong to assume that the farmer who adheres to unimproved methods is better off if he continues to use tall local varieties."[20]

A more comprehensive indication of modern variety performance without fertilizer is shown in trials at four locations over a 5-year period in the Philippines (Table 2.6). The results confirm the earlier observation made that "modern varieties do as well as traditional varieties without fertilizer."

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[20] *The IRRI Reporter.* The Economics of IR-8. IRRI, July 1967, Vol. 3, No. 4.

C. Patterns of Adoption of New Rice Technology

1. *The Awareness-Adoption Gap*

In contrast to the old notion of the farmer as a traditional creature, resistant to change and unwilling to take risks, Benno Galjart proposes a new model farmer whose most important trait is his readiness to consider and accept change in general. If the farmer does not respond positively to change, his behavior might be explained by (a) *ignorance* – the farmer does not know what he can do other than what he is currently doing; (b) *inability* – the farmer knows what he could do but is unable to do it for financial or other reasons; and (c) *unwillingness* – the farmer knows what he should do and can do it, objectively speaking, but he does not want to. Certain values and attitudes prevent him. Another way of putting it is that he prefers to achieve some other values.[21] Based on the Philippine experience, Galjart's new model of the farmer seems to offer so much more explanation of his behavior than the concept of the *subculture* of *peasantry* popularized earlier by Rogers. This subculture contains ten interrelated elements: lack of innovativeness, low aspirational levels, fatalism, familism, lack of empathy, dependence upon government authority, perceived limited good, lack of deferred gratification, traditionalism, and mutual distrust of interpersonal relations.[22]

Before the advent of the IR's and the C-4's, Lu studied the farm level implementation of a rice production program.[23] Of 395 farmers interviewed, 178 were aware of the existence of certified

Table 2.6. Yields of a traditional variety and two modern varieties grown without nitrogen fertilizer

Wet Season	*YIELD (t/ha.)*														
	IRRI			*Maligaya Station*			*Bicol Station*			*Visayas Station*			*All Stations*		
	*Peta**	*IR-8*	*IR-20*	*Peta*	*IR-8*	*IR-20*	*Peta*	*IR-8*	*IR-20*	*Peta*	*IR-8*	*IR-20*	*Peta*	*IR-8*	*IR-20*
1968	3.9	4.1	3.7	4.1	3.7	4.0	3.8	5.1	4.5	2.4	3.8	3.1	3.6	4.0	3.8
1969	2.9	5.6	5.2	3.8	5.2	4.4	3.4	4.6	4.0	4.1	4.0	5.2	3.6	4.8	4.7
1970	2.8	4.9	4.6	2.8	4.0	4.3	0.0	2.8	2.4	3.5	2.2	3.5	2.3	3.5	3.7
1971	1.3	3.6	3.8	2.9	2.5	3.2	3.1	3.2	2.9	4.6	3.9	3.8	3.0	3.3	3.4
1972	2.9	3.3	4.0	3.2	3.6	3.6	3.8	4.2	3.8	3.4	3.2	3.5	3.3	3.6	3.7
Ave.	2.8	4.3	4.3	3.4	3.8	2.8	2.8	4.0	3.5	3.6	3.3	3.8	3.2	3.8	3.9

*Peta is a typical traditional variety – tall and droopy leaved.
From: *The IRRI Reporter,* 3/73.

21 Benno Galjart, "Rural Development and Sociological Concepts, A Critique," *Rural Sociology,* Vol. 36, Mar. 1971, No. 1, pp. 31-41.

22 E. M. Rogers, Motivations, Values and Attitudes of Subsistence Farmers: Towards a Subculture for Peasantry. Paper presented at the Seminar on Subsistence and Peasant Economies, East-West Center, Honolulu, Hawaii, Feb. 22-March 6, 1965.

23 Hsueh-Yi Lu, *op. cit.*

seeds; 127 were aware of the source; 41 were able to obtain the seeds; but only 36 actually used the seeds. The 359 non-users gave a total of 609 reasons for not using certified seeds. The reasons are distributed as follows:

Reasons Given	*% of Farmers*
(1) Never heard about it	48
(2) Not available locally, limited supply and stocks arrive late	36
(3) Prohibitive price and no money	6
(4) Not interested; not applicable; haven't tried it yet	6
(5) Planting seeds provided by landlord or overseer	3
(6) Poor germination	1

Commercial fertilizer was not used by 156 farmers for the following reasons:

Reasons Given	*% of Farmers*
(1) Not available locally, stock arrive late and in limited supply	43
(2) Not interested because farms are fertile	19
(3) No money to buy and prohibitive price	22
(4) Unavailability of irrigation water and belief that fertilizers produce no good effects on the farm	10
(5) Landlord or overseer does not allow the use of fertilizer	3
(6) No reasons given	3

In the first example, the difference between 359 farmers interviewed and the 217 found to be unaware of the certified seeds represents the *communication or information gap.* The difference between the 178 farmers aware of the certified seeds and the 36 users represents the *awareness-adoption gap.* This gap is probably best described as an inverted pyramid, in which the number of farmers participating declines from awareness of the innovation to its actual use. Table 2.7 shows the gap between awareness and actual use of recommended rice production practices in 1966. It will be noted that certified seeds were the least known and least used of the ten practices. Insecticides and fertilizers were the most popularly used. Seed selection before harvesting was an old practice, since traditionally their own rice fields were the only source of seeds for the next planting season. Although 96 percent of the farmers were aware of seedboard varieties, only 57 percent actually used them despite the fact that many different varieties have been approved by the National Seedboard since the mid-1950's.

Table 2.7. Awareness and actual use of recommended rice production practices by 395 farmers from Central and Southern Luzon, 1966.

Rice production practice	*Percent of farmers' awareness*	*Actual use*
1. Fertilizer use	78	61
2. Certified seeds	45	9
3. Insecticides	97	67
4. Rodenticides	93	44
5. Seedboard varieties	94	57
6. Raised seedbed	78	25
7. Straight-row planting	98	42
8. Rotary weeder	95	32
9. Seed selection before harvesting	96	61
10. Germination test	82	37

Source: Hsueh-Yi Lu, *op. cit.*

2. *The Demonstration Effect*

This relative lack of farmers' enthusiasm for certified seeds and seedboard varieties changed remarkably with the advent of HYV's. The gap between awareness and adoption was very quickly bridged within one year in certain places. Table 2.8 illustrates this phenomenon which has been made possible by positive demonstration effects. As Pal puts it, "IR-8's highly visible yield potential legitimized itself."

Of the 22 farmers who planted IR-8 for the first time during the third season after its introduction in the village, 19 planted IR-8 on their entire rice farm and 3 planted it only on a portion of their farm. Of the 19 full adopters, 9 knew one to three very good farmers who had satisfying experience with IR-8. The rest (10) knew 4 to 11 or more such farmers.[24]

Table 2.8. Awareness and adoption of IR-8 in Macabling, Sta. Rosa, Laguna.

	1966 Wet	*1967 Dry*	*1967 Wet*
% who knew about IR-8	62	100	100
% who grew IR-8	26	62	88
% who did not grow IR-8	74	38	12

Source: Aurora G. Pal, The Adoption of a New Rice Variety (IR-8) in a Philippine Community. Unpublished M.S. Thesis, U.P. College of Agriculture, 1969.

[24] A. G. Pal, *op. cit.*

Further illustrations of this dramatic response are shown in studies at the village small-farmer level. From the first planting season to the next, the number of farmers who planted IR-8 showed the following trends: 1 to 10 to 16 to 60; 6 to 77; 3 to 44; 5 to 56; 8 to 42;[25] 7 to 49 to 70; 9 to 50; 15 to 113;[26] 70 to 96 to 132 to 121.[27] In May 1966 in Rizal province, 47 cooperators scattered in 18 towns planted IR-8 for seed purposes. By October 1967, six of the eight barrios in the town of Morong had planted a dry-season crop of IR-8. Two did not because of their inaccessibility to irrigation water. In the six barrios, 194 out of 645 farmers, or 30 percent, planted the variety for the first time.[28]

The influence of "seeing is believing" on this pattern of response cannot be discounted. Follow-up studies for six seasons (three

Plantings of Traditional or Non-Recommended Varieties

Dry Season	*1964*	*1965-66*	*1966-67*
No. of farmers planting	163	151	84
Hectares planted	304.66	272.36	116.20
Wet Season			
No. of farmers planting	155	96	29
Hectares planted	242.04	148.81	39.5

Plantings of Recommended Varieties

Dry Season	*1965*	*1966*	*1967*
No. of farmers planting	29	41	142
Hectares planted	30.41	54.23	172.84
Wet Season			
No. of farmers planting	25	81	220
Hectares planted	46.91	144.83	257.10

[25]Semi-Annual Reports 1966-67, for the project on alternative extension approaches. Farm and Home Development Office, College of Agriculture, University of the Philippines.

[26]Preliminary data from USAID and Asia Research Organization, Survey Data, Farm Statistics for 1965 and 1967 from Four Villages.

[27]Blanda R. Sumayao, The Bicolano Farmers' Response to an Improved Rice Variety IR-8-208-3. University of the Philippines, College of Agriculture, 1969.

[28]Antonio S. Frio, Leadership Preference, IR-8 Adoption and Communication Among Dry-Season Farmers of Morong, Rizal. Unpublished B. S. Agriculture Thesis, University of the Philippines, College of Agriculture, April 1968.

dry and three wet seasons) in seven villages from 1964 to 1967 picture the rise of the new varieties and the fall of the traditional, not only in terms of number of farmers but also in area planted.[29]

Although eight varieties were recommended, the most conspicuous change involved IR-8. In the 1966 wet season, only one farmer planted it in an area of 0.75 hectare. In the dry season of 1967, sixty farmers planted a total of 68.85 hectares. Trial plantings of IR-8 were made extensively, usually with technical supervision by knowledgeable persons. Its performance, therefore, was its own advertisement. The adaptability of the variety to different areas was still another advantage. The supportive function of this widespread success is illustrated in one village where the planting of IR-8 was considered a failure because the yield was only 70 cavans per hectare. While such yields had rarely been experienced before, the farmers' point of reference was not the traditional yield but the reputed and expected yield of IR-8 which was 100+. In spite of this "defined" failure, more farmers planted IR-8 in the following season. Any doubts they might have had about adopting the innovation were dispelled by the demonstrably higher yields of other farmers who had planted IR-8 under similar situations.[30]

Of course, as of 1973, IR-8 has disappeared almost completely from the Philippine scene, but this is more a manifestation of change-orientation than retrogression. In other words, those who dropped IR-8 picked up the newer varieties rather than reverting to the traditional ones. Early maturity of the HYV's doubtless contributes to their faster diffusion because the "wait and see" period is reduced from 140 to 160 days for the traditional varieties to 120 days or less for the HYV's.

3. *The Miracle Rice Package Pattern*

When IR-8-288-3 (more popularly known as "miracle rice") was introduced, it was emphasized that full yield potentials could be attained only if everything was "done right." IR-8 is referred to here not for itself alone but because it is the prototype of the HYV's, several variations of which have been developed and will be developed. In adopting IR-8 farmers not only adopted a new seed but also accepted a more general concept of modernization of other

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[29]Soledad L. Pahud, Some Factors Associated with the Adoption and Rejection of Recommended Rice Practices. Unpublished M. S. Thesis, University of the Philippines, College of Agriculture, 1969.

[30]Semi-Annual Report for 1966-77, *op. cit.*

Table 2.9. Practices adopted for IR-8 and for other varieties planted before and after the release of IR-8.

Practice	*Before IR-8*	*After IR-8 (Season)*			
		First	*Second*	*Third*	*Fourth*
		Percent			
(1) Seed treatment					
IR-8		56	70	63	69
Other varieties	43	43	39	35	41
(2) Spraying or soaking seedlings in chemicals before transplanting					
IR-8		80	79	73	68
Other varieties	61	66	47	49	54
(3) Dapog method					
IR-8		41	38	38	35
Other varieties	7	8	10	8	13
(4) Application of fertilizer before transplanting					
IR-8		30	43	38	37
Other varieties	14	14	13	15	16
5) Application of fertilizer anytime after transplanting					
IR-8		39	67	55	54
Other varieties	41	29	24	26	23
(6) Making and application of compost					
IR-8		15	4	3	3
Other varieties	7	10	5	3	3
(7) Straight-row planting					
IR-8		93	93	91	89
Other varieties	60	61	58	54	54
(8) Hand weeding					
IR-8		62	69	75	70
Other varieties	43	37	43	39	44
(9) Rotary weeders					
IR-8		32	70	63	64
Other varieties	49	49	42	43	44
(10) Weedicides					
IR-8		31	38	39	40
Other varieties	41	37	25	27	27
(11) Spraying against rice insect pests					
IR-8		89	81	80	76
Other varieties	76	69	62	57	59
(12) Rat control					
IR-8		39	77	72	80
Other varieties	75	77	72	66	73
N = IR-8		70	96	132	121
– Other varieties	72	65	104	89	70

Table 2.9 (Continued)

Summary of adoption scores (Percent of farmers)

	Before IR-8	*IR-8*	*Others*	*IR-8*	*Others*	*IR-8*	*Others*	*IR-8*	*Others*
0	4	–	14	–	10	–	11	–	11
1 - 4 practices	30	9	35	10	35	15	41	17	34
5 - 8 practices	47	63	40	59	47	60	44	58	49
9 - 12 practices	19	28	11	31	8	25	4	25	6

Source: Blanda R. Sumayao, "The Bicolano Farmers' Response to an Improved Rice Variety, IR-8-288-3," University of the Philippines, College of Agriculture, 1969.

rice production practices such as seedbed preparation, fertilization, spraying against pests and diseases, straight-row planting, weeding, etc. In Sumayao's study of 161 IR-8 seed recipients from two cities and four provinces in the Bicol Region,[31] the phenomenon of "special variety deserves special treatment" was very much displayed. The percentage of farmers adopting 12 recommended practices for IR-8 and for other varieties was analyzed over four cropping seasons (Table 2.9). It was found that the same farmers growing both IR-8 and traditional varieties gave the former preferential treatment. For all four cropping seasons, IR-8 adopters registered no zero scores, while 10 to 14 percent of those growing other varieties applied none of the other recommended practices in rice production.

Unpublished data on 75 IR-8 adopters and 115 non-adopters from seven villages similarly indicate greater adoption of the 12 cultivation practices among the former than the latter. IR-8 was more pampered even in comparison with other relatively recent improved varieties (Table 2.10).

Tables 2.11 and 2.12 as reported in IRRI studies also show the difference in inputs of fertilizer, insecticides, weedicides and labor in man-days per hectare with respect to local varieties and HYV. The yield differences are likewise obvious. Again, the partial adopters or those who planted both local and HYV gave different treatments to the two types of varieties.

On the other hand, Barker reported what appears to be a spill-over effect from the successful experience with the new package of practices associated with IR-8, when the yield of certain premium

[31] B. R. Sumayao, *op. cit.*

Table 2.10. Adoption scores of adopters and non-adopters of IR-8 during dry season, 1967.

Barrio	*Adopters*			*Non-Adopters*		
	Number Reporting	*Total Adoption Scores*	*Average Adoption Scores*	*Number Reporting*	*Total Adoption Scores*	*Average Adoption Scores*
(1) Bagumbayan	14	92	6.57	12	50	4.16
(2) Talangka	12	92	7.66	5	12	2.4
(3) Coralan	27	190	7.03	25	136	5.44
(4) Paagahan	2	11	5.5	26	100	3.84
(5) Cambuja	14	101	7.21	19	104	5.47
(6) San Antonio	2	7	2.5	8	20	2.5
(7) Nanguma	4	18	4.5	19	47	2.47
TOTAL	75	511	6.81	114	469	4.11

Source: Unpublished data from pilot study of a cooperative approach to rural development, University of the Philippines, College of Agriculture.

varieties increased. Malagkit, a glutinous rice used in preparing native delicacies, is grown only in a few areas. This variety commands a price approximately double that of IR-8. The high price is an incentive to farmers not only to plant Malagkit but to give it more care and inputs than are customarily given to local varieties. Table 2.13 shows that glutinous rice continued to be planted despite the

Table 2.11. Percent users of input among full adopters of HYV. 1966 and 1969, Laguna.

	Biñan		*Cabuyao*		*Calamba*	
	1966	*1969*	*1966*	*1969*	*1966*	*1969*
Fertilizer Users	72	100	65	86	83	95
Kg. Nitrogen/ha.	8	52	15	44	21	49
Yield MT/ha.	2.0	2.9	2.1	4.6	2.9	4.3
Herbicides Users	70	100	70	97	83	78
Pesos/ha.	2	6	7	9	5	8
Insecticide Users	41	97	52	93	69	78
Pesos/ha.	2	10	3	9	7	8

Adapted from: Randolph Barker and Violeta Cordova, The Impact of New Technology on Rice Production: A Study of Change in Three Philippine Municipalities from 1966 to 1969. Paper presented at the 28th International Congress of Orientalists, Canberra, Australia, Jan. 6-12, 1971.

Table 2.12. Adoption patterns of 155 tenant farmers in Laguna, 1966 and 1967 wet seasons.

	Full Adopters Local to IR-8 Variety		*Non-Adopters Local Varieties*		*Partial Adopters Local to IR-8 and Local Varieties*		
	1966	*1967*	*1966*	*1967*	*1966*	*1967 IR-8*	*1967 Local*
No. of Farmers	59	59	44	44	46	46	46
Inputs							
Nitrogen kg /ha	16	75	15	20	19	76	24
Fertilizer ₱/ha	28	99	24	30	31	106	38
Weedicides ₱/ha	5	8	4	9	4	7	2
Insecticides ₱/ha	3	19	2	5	3	18	5
Labor-man days/ha	54	76	52	50	53	79	51
Yield							
Cavans/ha	55	98	52	48	59	109	57
Ave. area of variety per farm	2.4	2.4	2.4	2.4	2.5	1.1	1.3

Data from: IRRI Agricultural Economics Annual Report, 1967.

inroads made by HYV's. The areas where Malagkit was planted had a special use for the variety as a major ingredient in connection with a home industry.

Early in the life of the HYV's, it was established that production cost would be higher than that for traditional varieties. Although this was a negative factor for its adoption, the demonstrated profitability despite higher investments was such that it overcame the farmer's objections on this score. Otherwise, the HYV's would have never spread as quickly as they have. Table 2.14 illustrates this profitability because high yields more than compensate for the high costs. With the increasing area and number of farmers adopting HYV's, the yields have tended to decline but so have the costs because the later adopters planting larger areas were not using as much inputs anymore. This tendency is evident in Table 2.14 where four farmers planted IR-8 in 1966 and 200 in 1967. The reduction in yield was from 165 to 133 cavans per hectare and the corresponding drop in cash costs was from ₱1,141 to ₱779. The net return per hectare decline by ₱150.

Even in very small rice plots (less than a hectare) found in an area which is not a major rice grower, the modernization in

Table 2.13. Percentage of area planted to HYV, glutinous, and other local rice varieties, 3 municipalities of Laguna, 1966 to 1969.

	Wet Season				*Dry Season*		
	1966	*1967*	*1968*	*1969*	*1967*	*1968*	*1969*
	— Percent of Area —						
Biñan							
HYV	0	39.2	92	80.2	3.8	58.0	96.7
Glutinous	0	2.3	4.8	1.8	3.0	0	0
Other local	100	58.5	3.2	18.0	93.2	42.0	3.3
Total	100	100	100	100	100	100	100
Cabuyao							
HYV	1.9	63.6	69.8	68.0	18.0	57.8	42.5
Glutinous	26.6	27.7	30.2	28.0	9.5	3.1	4.5
Other local	71.5	8.7	—	4.0	72.5	39.1	53.0
Total	100	100	100	100	100	100	100
Calamba							
HYV	1.2	59.6	50	60.7	65.0	55.3	58.1
Glutinous	92.7	28.2	48.5	38.7	5.0	8.2	10.0
Other local	6.1	12.2	1.5	0.6	30.0	36.5	31.9
Total	100	100	100	100	100	100	100

Source: R. Barker and V. Cordova, *op. cit.*

Table 2.14. Comparative costs and returns per hectare on farms using IR-8 and traditional varieties, Rizal, 1966 and 1967 dry season.

		1966		*1967*	
		IR-8	*Binato*	*IR-8*	*Binato*
No. of farms		4	143	200	127
Costs:					
Fertilizers	(₱)	270	50	146	39
Chemicals	(₱)	45	10	61	4
Other cash costs	(₱)	287	210	193	83
Costs in kind	(₱)	539	176	379	249
Total cash cost and in kind	(₱)	1141	446	779	375
Yield cav. per ha		165	75	133	72
Gross returns	(₱)	2640	1200	2128	1151
Net returns	(₱)	1499	754	1349	777

Source: IRRI Agricultural Economics Annual Report for 1967.

production practices has accompanied the introduction of HYV's (Table 2.15). The installation of irrigation pump has also made a great difference in the village of Canipa, Baybay, Leyte. Before HYV and irrigation, this barrio registered the lowest adoption of practices like fertilization, straight-row planting, insecticides, etc. The change from pre-HYV to 1971 is more pronounced than in the two other villages of Marcos and Tab-ang where about three-fourths of the farmers were using such practices even before HYV because they had irrigation. By 1971 and with HYV's, the adoption rates for the practices had gone up to almost 100 percent.

Table 2.15. Adoption of farming practices before and after HYV's (3 barrios of Baybay, Leyte), 171 farmers.

	Canipa		*Marcos*		*Tab-ang*	
	Pre-HYV	*1971*	*Pre-HYV*	*1971*	*Pre-HYV*	*1971*
Ave. size of rice area (ha)	0.77		0.40		0.71	
% of rice area irrigated	90		99		99	
% of rice area double-cropped	100		100		100	
% using straight row planting	39	98	79	100	83	98
% using mechanical weeder	34	98	79	98	83	98
% using herbicides	3	16	4	5	2	21
% using insecticides	21	94	66	98	97	98
% using own sprayer	0	23	0	14	0	34
% using 2-wheel tractor	0	0	0	2	0	2
% farms irrigated by gravity	0	0	96	98	100	98
% farms irrigated by pump	35	86	–	–	–	–
% using chemical fertilizer	21	88	68	98	66	98
Ave. application of NPK						
kg /ha N	16.77	26.51	24.58	28.64	24.25	39.28
P	8.82	10.15	15.75	10.75	7.29	31.17
K	8.82	10.15	15.75	10.75	7.29	31.17

Source: T. E. Contado and R. Jaime, A Study of Changes in Rice Farming in Baybay, Leyte, U. P. College of Agriculture, 1972.

4. *The Risk-Distribution Pattern*

When accepting anything new, the farmer assumes certain risks, and he responds to change in ways which will enable him to reduce these risks. Some farmers, however, are more prepared to take risks than others.

Gradual adoption. Liao's study categorized 155 farmers according to two criteria: the percent of their farm planted to new varieties, and time of adoption. On the basis of the first criterion, three

categories were defined:

(a) *Full adopter* – any farmer who planted 100 percent of his area to the new varieties (39 percent of all farmers in the study).

(b) *Partial adopter* – any farmer who planted only a portion of his farm to the new varieties (31 percent).

(c) *Non-adopter* – any farmer who continued to plant the old varieties (30 percent).

Liao then classified farmers as *earliest, relatively early, relatively late,* and *latest* adopters, according to the span of time taken between awareness and adoption. The earliest adopter took 4 months; the relatively early, 7 months; the relatively late, 13 months; and the latest, 19 months. The average percentage of farm area planted to new rice varieties for the first time gradually increased from 42 percent to 66 percent for the earliest adopters, to 74 percent, and then to 83 percent for the latest adopters. This indicates that the first adopters, although more immediately responsive to the change, were faced with greater risks and were therefore less inclined to go all the way than the latest adopters who were able to benefit from the experience of others.

Multiple-Variety Planting

There are evidences that even during the pre-HYV era, rice farmers had already been on a constant search for suitable varieties. As Molster observed in a Laguna village in 1964:

"Certified seed was not used in the barrio, probably as a result of its higher price combined with unawareness of its advantages. The farmers were keen to use the best varieties they knew and could get, which was illustrated by the unceasing changes of the planted acreages with different varieties in successive years. There was a large choice of local and 'approved' varieties available. The types used differ from barrio to barrio, depending not only on environmental conditions but also on personal preferences and on the interaction with the cultivation methods used locally. During the wet season of 1964-65, 68 percent of the rice fields of San Antonio II were planted with the recommended BPI-76 and 27 percent with the popular Quezon variety.

"The newer FB-121 variety was tried by a few farmers in two preceding years, but the results were not convincing. In the dry season the area was divided equally between a local variety and a variety which was recommended until a few years ago.

"Because of the prevailing rat infestation, a new variety must ripen at the same date as the varieties already in use. Even if the introduction were to cover the whole area, the 'rat-balance' with the nearby barrios may be upset. If the rice is late, all the rats from the neighborhood will move to the fields which have not yet been harvested."[32]

Multiple-variety planting over four seasons was observed in 1967 by Dimaano and de Guzman.[33] Only 15 out of 45 farmers using recommended varieties for the first time planted their fields to one variety alone; 24 planted one recommended variety in combination with local varieties. For four seasons the trend was for the number of farmers planting one recommended variety to increase and then decline because they switched to two or more recommended varieties and did not return to the local types. The reason most frequently given for the multiple-variety planting was the desire of planters to find out which would give more yield. In the earlier stage, the farmers planted as many as six varieties, including the old ones. This was done for insurance purposes just in case the new ones failed. In the later stage, when confidence in the new plant type had been established, multiple-variety planting was more of an experiment to test which one performed better. Such farmers had moved up one more step toward modernization.

With the introduction of HYV's, the identifiable trends could be seen (Table 2.16). Single HYV plantings on the entire farm is the most predominant pattern now. The combination of improved and HYV comes next and then the combination of HYV's. In the dry season when water supply is less dependable, there is a higher proportion planting Intan (an improved variety) because it is less susceptible to lodging during the dry season. The tendency to plant the whole farm to only one HYV is based on previous successful experiences with the variety. The danger, however, lies in the total exposure of the whole farm to all the risks a single variety is heir to. In the event of disease and pest infestation a single variety which proves susceptible would lead to a total wipe-out of the crop. However, in the event of good harvests associated with certain HYV's the full benefits would also be reaped by the entire farm.

[32] H. C. Molster, Notes on Rice Farming and Extension in a Philippine Village, *Aspects of Rice Growing in Asia and the Americas.* Miscellaneous Papers 7 (1970) Landbouwhogeschool, Wageningen, The Netherlands.

[33] A.M. de Guzman and C. M. Dimaano, Coralan Rice Farmers' Response to Change in Cropping Pattern: A Case Study. The Seminar-Workshop on the Economics of Rice Production, IRRI, Dec. 8-9, 1967.

Table 2.16. Percent of fatmers planting different varietal types for wet and dry seasons, 1970-71 (3 barrios of Gapan, Nueva Ecija).

	Wet		*Dry*	
	1970	*1971*	*1970*	*1971*
		–Percent–		
Local only	1.1	–	–	–
Improved* only	5.2	0.5	28.4	5.4
HYV only	74.0	76.0	64.6	77.0
Local and improved	1.1	.5	–	–
Local and HYV	2.6	3.5	–	2.6
Improved and HYV	9.8	7.0	3.5	–
Improved and improved	1.5	–	–	–
HYV and HYV	3.6	12.0	3.5	14.2
Local-improved and HYV	1.1	.5	–	–
HYV, improved and HYV	–	–	–	.8
Total N	193	193	116	113

Source: R. T. Herrera, *op. cit.*

*Improved varieties are those earlier recommended by the Seedboard. These include Intan, Peta, Bengawa, Raminad, etc.

A seasonal pattern. A seasonal pattern for the adoption of recommended rice varieties has been reported by Pahud in studies carried out among 179 farmers in seven villages from 1965 to 1967.[34] The number of farmers adopting new varieties was found to be higher for the wet than for the dry season. Barker observed the same trend:

"This strategy of choosing separate wet and dry season varieties seems particularly appropriate on those farms with uncertain or limited dry season water resources. Farm operators in this situation can ill-afford the risk associated with the high levels of fertilizer input needed to maximize profits for IR-8 during the dry season. On the other hand, local varieties respond to medium input levels of nitrogen during the dry season without lodging."[35]

[34] S. L. Pahud, *op. cit.*

[35] Randolph Barker, Economic Aspects of High-Yielding Varieties of Rice with Special Reference to National Price Policies: IRRI Report. Paper prepared for the 13th Session of FAO Study on Rice, Manila, February 20-27, 1969.

Farmers make a distinction between varieties and their suitability for dry or wet seasons. Groot's study done in 1969 showed that 77 percent of 142 farmer-respondents perceived these differences and therefore their varietal preferences were influenced accordingly. However, preference was not always actualized in planting because of availability, decision-making shared with other persons, price, etc.[36] However, with the development of non-seasonal HYV's and if irrigation water is available for both seasons, the same varieties could be planted for both seasons and from one season to the next. Since varieties are being developed more and more along these lines, seasonal distinctions with respect to varietal suitability may become more blurred.

Rainfed vs. Irrigated Response Pattern

Closely related to the seasonal pattern is the differential response of the irrigated and rainfed areas to the HYV's with the former adopting them more quickly than the latter. Tables 2.17 and 2.18 show this very distinctly from 1966 to 1970. Barker, *et al.'s* analysis

Table 2.17. Pattern of varietal adoption on irrigated two-crop and rainfed farms, Gapan, Nueva Ecija, wet season, 1966 to 1970.

	1966	*1967*	*1968*	*1969*	*1970*
Irrigated 2-Crop					
IR-20	0	0	0	8	190
IR-8	2	19	94	58	3
IR-5	0	2	18	127	67
C4-63	0	2	20	88	75
Binato) Traditional	290	288	204	67	8
Others)	14	7	8	22	26
Rainfed					
IR-20	0	0	0	0	12
IR-5	0	0	2	21	47
C4-63	0	0	0	11	21
Intan	89	96	99	98	88
Tjeremas	33	34	34	36	29
Others	2	2	7	9	17

Source: Randolph Barker, *et al.*, The Changing Pattern of Rice Production in Gapan, Nueva Ecija, 1965 to 1970, IRRI Saturday Seminar, December 11, 1971.

[36]Hans C. Groot, Co-orientation and Technological Change: Communication Variables in Perceptions of Miracle Rice in the Philippines. Unpublished Ph. D. Thesis, University of Wisconsin, 1970.

Table 2.18. Percent of farmers planting HYV's in three barrios of Gapan, Nueva Ecija, 1966-1972.

	1966	*1967*	*1968*	*1969*	*1970-1971*	*1971-1972*
Mahipon (rainfed)	–	0.5	0.5	11.4	75.5	96
Malimba (2-crop irrigated but water supply has problems)	–	4.7	35.3	100	100	100
San Nicholas (2-crop irrigated. Good irrigation system)	2.9	9.5	66.7	98.1	99	100

Source: R. Huke and J. Duncan, *op.cit.* and R. T. Herrera, *op. cit.*

of yields and input level in three categories of farms, namely, irrigated two-crop, partially irrigated and rainfed, revealed higher yields and higher inputs where water supply was more available and dependable. On the irrigated farms, the shift from local to HYV's appeared to have improved yields from 2.2 to 3 tons per hectare. On the rainfed farms, the yield advantage for HYV's did not become manifest till 1970. IR-5 was found to be more drought-resistant and therefore readily gained acceptance. By 1971-72 the tungro virus had attacked this variety, leading to its near demise in the succeeding seasons.

In the early days of IR-8 nearly 100 percent of the farms of early adopters were fully irrigated. This level dropped to 50 percent for the later adopters. Because of the uncertainties involved, poor irrigation facilities are associated with lower input levels, lower yields and lower farm profits.[37] This phenomenon is shown again in Table 2.19 where the villages of Mahipon, Malimba, and San Nicolas differ in quality and quantity of water supply. Mahipon is rainfed while Malimba has irrigation facilities which are not functioning as effectively as the system in San Nicolas. The rather small yield differences between Malimba and rainfed Mahipon probably reflect the water problem as much as any other factor of production. More than 50 percent of the farmers in Malimba complained of low water level in the dry season, irregular flow of water and inability of water to reach farms at the end of the canal. Among the farmers in San

[37] IRRI, Agricultural Economics Annual Report, 1967

Table 2.19. Average yield and NPK applied in three barrios of Gapan, Nueva Ecija.

	Yield (cavans/ha)		N P K (kg/ha)					
	Pre-HYV	Wet Season 1970-71	Pre-HYV	1970-1971	Pre-HYV	1970-1971	Pre-HYV	1970-1971
Mahipon	36	43.1	15	25	15	27	12	24
Malimba	46	48.0	27	52	17	23	8	10
San Nicolas	53.8	78.6	25	70	22	24	16	18

Nicolas only about a third registered these complaints.

5. *Change in Cropping Pattern*

Cropping patterns, comprising all stages of rice production from planting to harvesting and the time and place of planting, are established in every village. They are usually pursued from year to year with little or no deviation. Now and then, however, certain occurrences — either induced deliberately or through a *force majeure* such as floods, typhoons and drought — disturb these routines.

A change in cropping pattern takes the form of a structural change; it is not just a change in technique. Availability of water during the growing period of the rice plant has been a basic element of the cropping pattern. With the development of HYV's which mature earlier than local varieties, a fundamental readjustment had to take place. In some cases, the change in cropping pattern has been strategic for the introduction of a whole package of practices. In other instances, the new variety, in combination with the development of irrigation systems, has encouraged and brought about a change from one to two or even two and a half crops a year. Preparation of the land for the next crop has become urgent; hand tractors, either bought or hired, have been employed to speed up the work. A flood avoidance strategy has also been effected in certain areas by changing the planting season from June-July to November-December. (Farmers are amenable to the change, since they grow only one crop a year without irrigation anyway.) Changes in time of planting

have been possible because of the non-seasonal nature of the HYV's.

Recognition of the need to change cropping pattern has often come about through technical advice from outside the village. In case studies described by Pahud, de Guzman and Dimaano in 1967, change was brought about in the following manner:[38] First, although change in the cropping calendar meant missing almost one crop, the extension worker was able to convince the farmer to do this because the previous season had produced very low yields. Severe virus infestation was primarily responsible. Another related factor was insufficient water supply which made straight-row planting, use of rotary weeders and application of fertilizers virtually impossible. Weeds which had grown taller than the crop became a favorable environment for leafhoppers transmitting the virus. An examination of the rainfall distribution and irrigation water readings for two previous seasons revealed that farmers had been planting when the supply of irrigation water was inadequate. Because of the water problem, only nine of the 20 initial farmer-cooperators during the previous season were able to follow some of the recommended practices the next season. All told, a measure of receptivity to new varieties in this case resulted from desperation rather than from a positive attraction to it.

Second, the crop technician's proposal to change planting time to take advantage of periods with more abundant water supply was presented to the farmers on a majority or not-at-all adoption. Although the nature of the problem and the prospect of a solution were explained to the farmers individually, commitment to the change was sought in a group meeting, and social pressure to conform was brought to bear on the reluctant ones by the farmers themselves, particularly when they were cultivating adjacent fields. Fifteen were willing to go along with the plan, although the farmer with the largest acreage was critical of this approach because change could be initiated on his farm without the agreement of other farmers.

Third, planting at about the same time required planting similar or identical varieties over a wide area. Small, scattered changes would not accomplish the objective. This system became a perfect entree for new varieties. Mass planting of varieties with similar maturity became a *must* because differences in maturity period would expose a particular sector at a particular time to the concentrated attack of

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[38] S. L. Pahud, *op. cit.* and A. M. de Guzman and C. M. Dimaano, *op. cit.*

birds, rodents, pests and diseases.

Fourth, initial agreement among most, though not all, farmers led to intensive lessons through a barrio rice school and a new calendar of farm activities prepared and followed up by the extension worker.

The effects of the change in cropping pattern could be seen in the increase of new farm practices adopted. Almost twice as many farmers adopted new practices along with the change in cropping pattern as those who did not. The practices which decreased after the new cropping pattern was inaugurated were seed selection, because seeds of the new varieties were obtained from outside the village; compost-making, because more commercial fertilizers were used; and rat control, because mass planting and clean culture reduced infestation. Initially, farmers who refused to follow the new cropping pattern had higher yields; those who followed either caught up with or even outyielded them. In one village the yield doubled. After adopting the new cropping pattern, farmers also claimed they visited the farms more often than those who did not follow the change. As the farmers themselves remarked then: "We became more industrious."

However, the combination of HYV's and water availability has resulted in some peculiar patterns and problems in other places. Stewart describes the phenomenon of "staggered planting" in Hagonoy, Davao del Sur:[39]

> "There is no pronounced wet and dry season in Davao del Sur, so the agricultural calendar is not strongly influenced by climatic factors. The entire area studied is irrigated and there is usually no shortage of water, so at least potentially water is always available to the farmer. This fact, combined with the short maturation period of the HYV's, leads many farmers to replant their land as quickly as possible after harvest. They are probably encouraged to do this by the availability of hand tractors to assist them in land preparation. The speed of this 'hurry-up' land preparation, as they term it, varies from farmer to farmer – even between neighbors. This is particularly true where some farmers have money to hire tractors while others must rely on their carabaos, or where only a limited number of tractors are available to service a large number of farmers.
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> "The result, particularly evident after several seasons, is that in a simple contiguous area one can find rice plants in virtually all stages of development. Farmers only short distances apart may be preparing land,

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[39] James Stewart, Immigrant Rice Farmers: Rice Cultivation in Hagonoy, Davao del Sur, Philippines. Ateneo de Davao, 1972.

transplanting, weeding or spraying their half-grown plants or harvesting all at the same time. Naturally this makes for a devilish problem of water management and may lead to conflicts between neighboring farmers. It also greatly increases the problems of pest and disease control, and it may affect the availability of additional manpower during the critical periods of transplanting and harvesting. The farmers themselves recognize staggered planting as one of their most serious problems, but the solution so far has been difficult.

"For example, the National Irrigation Administration (NIA) decided to cut off the water supply from May 1 to 31, reopening on June 1, 1972. Many farmers expressed favor with the plan. However, when May 1 drew near, it turned out that some farmers encouraged by rains a month or so earlier – had gone ahead and planted despite the pending closure. NIA was petitioned by some farmers to continue the supply of water and political pressure was brought to bear by a top provincial official. The closure date was moved to May 16 and the system was finally closed down for two weeks during a period of heavy rains. The effect on the planting schedule is not yet certain, but it is expected to be minimal.

"While NIA officials express concern over staggered planting in Hagonoy, one of their own policies seems to have encouraged the practice. It is a NIA policy to waive irrigation charges for any farmer who can plant a third rice crop within a one-year period, ₱60.00/year, paid by the tenant. Understandably, the incentive of this waiver leads farmers to replant as quickly as possible – often with the result that some plant well ahead of others. The NIA policy obviously seeks to maximize productivity per irrigated hectare per year, but it is questionable whether or not it accomplishes this objective. It is true that some farmers produce five crops in two years under this arrangement. However, given the staggered planting and its results, combined with the very limited use of fertilizer and the hasty land preparation involved, it is doubtful that the NIA incentive contributes to the overall productivity of farms on the irrigation system."

Pigcawayan, Cotabato presents another case of this undefined period for planting and harvesting in its three barrios. As Kimpo describes it:

"In Capayuran, for instance, the planting period for the wet season starts in June. One month after the start of the planting, 20 percent of the 25 farmers interviewed have not yet harvested and 36 percent have already planted. At the start of the dry season planting in December, 36 percent have not yet harvested while 12 percent are already engaged in planting. The same holds true in Bulacan. At the planting season in June, 28 percent are harvesting while 40 percent of the farmers have already planted. In the dry season planting in December, 28 percent have already planted while 48 percent were still harvesting. One month later, 32 percent have planted while 16 percent were still harvesting.

"In Maluao for the wet season 1971, it was reported that the planting

season ends at the start of the next planting season. The planting season covers a long period ranging from 4 to 5 months. At the start of the planting in December, 20 percent had planted while 32 percent were harvesting. In February, 40 percent were planting while 32 percent of the farmers were still harvesting. About 24 percent of farmers interviewed in Maluao were reported not to have farmed in the wet season 1971 due to the floods and 12 percent had not harvested at the end of the dry season. As a result even with the use of HYV, a considerably low yield is obtained."

Among the factors contributing to this undefined cropping pattern are water scheduling and flooding. Run-offs from the higher areas which go to nearby creeks and cause an overflow of water in the lowland make farmers hesitant to plant on time. For farms irrigated by the National Irrigation Administration, farmers hasten land preparation by using rented tractors. Those who cannot afford the tractor rental use the carabao. Limited credit sources and shortage of capital to purchase fertilizer and chemicals and to hire labor affect the planting activities of farmers.[40]

The phenomenon of staggered planting demonstrates the interacting relationship between and among technological, environmental, employment, institutional and organizational factors. Obviously, the farmer cannot continue to function individually within this context.

Another illustration of the combined effects of irrigation and HYV on cropping pattern was reported from Baybay, Leyte by Jaime and Contado. In two of the three villages studied (Marcos and Tab-ang) two crops a year was usual practice because they had a communal gravity irrigation system for as long as farmers could remember. However in 1968, farmers in Marcos learned from the Visayas Agricultural College nearby that continuous rice cropping (or 5 crops every 2 years) throughout the year was possible because of the early maturing HYV's which have no dormancy. The new 5-crop cycle every two years started in Tab-ang in 1969 using IR-8 and in Canipa in 1971 using IR-8, IR-5, and BPI-76. This continuous cropping made disease and pest control a real problem and was blamed for the tungro epidemic in 1970-71 which resulted in a substantial crop loss. After that experience, farmers started going back to the two-crop a year system and efforts were exerted to synchronize planting and harvesting in order to break the disease and

[40]Eva Kimpo, Factors influencing Productivity in the Three Barrios of Pigcawayan Cotabato, Notre Dame University, 1972.

[41]R. Jaime and T. E. Contado, A Special Report on Irrigation as an Aspect of Changes in Rice Farming in Baybay, Leyte. U.P. College of Agriculture, 1973.

pest cycle. Furthermore, the continuous cropping led to the neglect of other farm enterprises, lack of pasture area for the carabaos and productivity of the land using the same variety tended to decline.[41]

The ecological implications of HYV, continuous cropping, irrigation, pest and disease incidence clearly need to be given attention.

6. *Acceptance, Rejection and Discontinuities in Adoption*

In spite of all the exciting developments in rice production over the past 5 or 6 years, the adoption process has not been a uniformly linear climb. Observations to this effect were made by Sumayao[42] who classified IR-8 adopters as *initial planters* who received and planted the seeds when they were first distributed; *persistent planters* who planted IR-8 for the first time after the first IR-8 crop; *dropouts* who stopped planting IR-8 the following season; and *replanters* who planted IR-8 for the first season, dropped it the second season and picked it up again during the third season. As previously mentioned, the adoption of HYV's has been a persistent process but the adoption of a specific HYV has been rather short-lived so far. As they say: "Exit IR-8, enter IR-5. Exit IR-5, enter IR-20." While the new plant type has been widely accepted the adoption of a specific variety depends very much on its merits and proven performance. An HYV is dropped in favor of another or a newer one the moment its weaknesses begin to show up.

Adoption graphs for 12 practices studied for 4 seasons show zigzag steps rather than a smooth upward increase. Pahud[43] observed the same trend over 6 cropping seasons. She classified as *early persistent adopters* those farmers who adopted 50 percent of all the recommended rice practices during the first three seasons and continued to do so for the latter three consecutive seasons; *late persistent adopters,* those who adopted 50 to 60 percent of all the practices during the latter three consecutive seasons; *later adopters,* those who adopted 60 to 70 percent of the practices during the latter two seasons; *readopters,* those who adopted, dropped, and picked up practices irregularly during the six seasons (the largest group of farmers in Pahud's study belonged to this category); and *dropouts,* farmers who adopted 40 percent or more of the practices during the first three seasons but adopted only 10 to 20 percent for the latter three seasons.

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[42] B. R. Sumayao, *op. cit.*

[43] S. L. Pahud, *op. cit.*

Only a season-by-season analysis would indicate these discontinuities; a long-term trend would not reveal this zigzag. Long-term trends are described in Liao's comparison of farm practices between 1954-55 and 1965-66. In 1954, land preparation – the tillage, harrowing and levelling – had been done by carabao and man-labor; by 1965, 32 of 87 farmers studied were using hand tractors. Similarly, transplanting had been carried out by the ordinary and broadcast method; ten years later, 49 out of 87 farmers were practicing straight-row planting. The number of farmers applying fertilizer increased from 61 to 78; and average per hectare application increased 43 percent. Chemical weeding which was unknown in 1954 was used by 75 farmers in 1965.[44] Follidol, Dol granule, BHC, Basudin, and Furadan have become part of the farmers' vocabulary.

To better understand the patterns of acceptance, rejection, and discontinuities in the adoption of HYV's and other recommended production practices, farmers' reasons as found in several studies were analyzed. The most often cited reasons for adoption were the demonstrated superiority or effectiveness of the new practices, expected high yield, the consequent minimization of loss, increased efficiency of farming operations, and the relative advantage of the new over the old practices. Besides the general expectation of high yields from HYV's, specific varietal characteristics were mentioned such as early maturity, disease resistance, drought resistance and eating quality. One study done in 1969 also found what farmers dislike in rice varieties: *very tall plants with late maturity* and *low tillering ability.*[45] Such dislike was crystallized only after about two years of the HYV's. Before that, the varieties farmers were used to were characterized by all the qualities presently disliked.

Specific institutional, personal or group pressures for adoption such as desire to follow neighbors and to comply with landlord's wishes or with the change agent's recommendations were reported by some farmers.

Non-adoption of innovations or dropping them after they have been tried is very much conditioned by the perceived incompatibility or ineffectiveness of the practice with existing situations on the farm and in the village, – anticipation of or actual experience with

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[44]David S. H. Liao, Factors Affecting Productivity and Adoption of Improved Practices in Rice Farms. Unpublished M. S. Thesis, University of the Philippines College of Agriculture, 1968.

[45]Hans C. Groot, *op. cit.*

undesirable results, lack of resources, limited comprehension of cause-effect relationships, ignorance of new practices and how to apply them. They stated that fertilizers could not be used where fields were always flooded; rat control measures were of limited usefulness unless neighboring farmers adopted similar measures; straight-row planting could not be done as long as skilled planters were not available; rotary weeders could not be used because of lack of water; and there was no capital to buy fertilizers. Earlier, the objection to fertilizer application was the fear that constant use would lead to "fertilizer addictedness" of the soil; hesitation in spraying insecticides was due to fear of killing the chickens, pigs and carabaos. Wilting of rice plants was sometimes attributed to the rotary weeder's agitation of the soil; empty grains were blamed on the use of highly concentrated chemical solution. In general, a lack of understanding of cause-effect relationships contributes to slow or hesitant response. A major reason for discontinuing a practice is failure of the innovation to demonstrate its superiority or effectiveness. For example, a farmer might say: "I sprayed my field with 2-4-D but it did not control the weeds in my field." Quite often, complaints about ineffectiveness are a result of improper application of the innovation. Disease and pest susceptibility of a rice variety is a very potent and immediate reason for switching to a new or different one. Despite floods, typhoon and tungro, the willingness to plant HYV's and to use fertilizer and insecticides remains extremely high. Although the farmers from Hagonoy, Davao del Sur[46] cut down on fertilizer use, they seemed to have continued on with other practices.

From the socio-cultural point of view, a more intriguing innovation than HYV is the practice of straight-row planting and the accompanying rotary weeder and/or the application of herbicides. In 1964, a Dutch agricultural economist who lived in a rice-growing village in San Pablo City, Laguna made the following observations on transplanting and weeding:[47]

> "Traditionally, seedlings are planted at random in groups of 3 or 4 per hill. A guitar player may sit on one of the levees bordering the rice field, and the rhythm of his music then determines the rhythm of planting. Recently, rotary weeders were introduced from Japan, and the farmers who used this implement had to plant in one-row-straight system. However, working with the familiar guitar is impossible with this system,

[46] J. Stewart, *op. cit.*

[47] H. C. Molster, *op. cit.*

which does not make its introduction very popular. The fact that planting in straight rows gives a more even distribution of the plants over the field, is not considered by the farmers to be an advantage.

"In barrio San Antonio II (San Pablo), 14 out of 23 rice farmers used the one-row-straight system, although two of them did not use the rotary weeder. Straight rows were considered anyhow an advantage in weeding. An interesting item was that since the skill of planting in straight rows was not yet mastered by the barrio people, transplanting had to be done by people from outside the barrio. The new system also took slightly more time than the old system. These two reasons made the one-row-straight system somewhat more expensive than the traditional method.

"The farmers were clearly not interested in planting in real squares. They expected this to cost twice as much time and money for the disputable advantage that the rotary weeder could then also be used crosswise. Locally, several devices were developed to use the two-row-straight system, the simplest being the use of an ordinary rope line.

Weeding

"Weeding takes about 35 percent of the labor involved in growing and harvesting a rice crop, and is carried out solely by the farmer and his family. The work is spread over a rather long period of time. To measure the time devoted to handweeding is difficult, since it is often done while passing by the field or in addition to other jobs.

"One farmer stated that he considered it an entertainment, of which the time it took him was of no importance to him. It seems, however, that the introduction of labor-saving techniques will be relatively easy in this field, since two techniques, the use of the Japanese rotary weeder and the use of herbicides, have both gained considerable ground.

"The rotary weeders were of an all-metal type, costing ₱20. Some farmers mentioned as a reason for not using the rotary weeder that it damaged rice plants in the wet season. The technician, however, found out that the damage was actually caused by cutworms.

"The three available sprayers (one from the technician, and two from the farmers) were lent without charge, but with the obligation to provide for any repair. One farmer remarked that under this system his sprayer had less than half its normal lifetime, but he accepted it as it was.

"The available data did not indicate that the new techniques reduced the weeding labor. On the contrary, in the dry season the average weeding time for the farmers who practiced handweeding only, was lower than for the others. In the wet season the reverse was true with, on the average, the shortest weeding time for those who used the sprayer and the rotary weeder."

De Guzman's report from farmers of Biñan, Laguna in 1963 found that less than 50 percent of farms along the highway did not

use straight-row planting. The objections to the practice were that it is laborious, expensive, involves hiring transplanters who have the required skill and there are no yield advantages anyway.[48]

As of 1973, in Laguna province where Molster and de Guzman made their observations, straight-row planting and the use of rotary weeders were common in almost all lowland rice-growing areas in the province.[49] As a consequence, the use of guitar music which provided rhythm for rice transplanting has completely disappeared.

While straight-row planting and use of the rotary weeder have been firmly established in Laguna and Leyte, the situation in Gapan, Nueva Ecija, Davao del Sur and Cotabato is quite different. Herbicides and sprayers are the chosen means for weed control in the latter three places. Anyone who has seen their rice fields can readily make the observation that weeds remain a competitor of their rice plants. In Laguna and Leyte, besides the use of family labor in weeding, there is a prevailing custom locally known as *kamkam* in Laguna and *ambo* in Leyte whereby neighbors, relatives or friends can have the option to harvest a portion of the farmer's field by performing the weeding operation during the rice-growing period. Besides a one-sixth or one-seventh share, the weeder-harvesters usually receive their shares in tightly packed cans, hence farmers are beginning to realize that the traditional custom might be more expensive than hiring weeders and harvesters for a wage. However, the lack of cash and social pressures to provide other members of the community a chance to participate in the harvest militates against the shift. The popularity of herbicides and sprayers in Davao del Sur and Cotabato is related to seasonal labor shortages due to continuous cropping and other wage labor opportunities offered by sugar cane and coconut plantations in Davao. In Cotabato, larger operating farm units and the problem of staggered planting probably aggravate the situation and make the use of herbicides more practical than the use of labor for weeding.

What is difficult to understand in the case of Gapan is the failure of straight-row planting to gain a foothold except in one barrio where a rural reconstruction worker who was in residence for sometime had introduced the practice. The reasons cited for non-adoption of this particular innovation are lack of skilled planters

[48]L. P. de Guzman, The Rice Farmers' Response to Technological Change, (Paper presented at the IRRI Seminar, Jan. 30, 1964).

[49]Sociology Research Department: An Evaluation Research of the Philippine Rural Reconstruction Movements' Barrio Development Program in Laguna: Baseline Study. Asian Social Institute, Manila, Jan. 1973.

and hence much higher costs involved. Although these are very profound reasons, they were the same objections raised by Laguna farmers in the early 1960's. Somehow, when skilled planters from the outside were brought into a village where straight-row planting was not practiced, the local transplanters learned and acquired the skills within one planting season. Skills, therefore, were no longer scarce after two seasons. Why has not the same thing occurred in Nueva Ecija despite the fact that it has been the recipient of considerable extension services? The argument of high transplanting costs is not a very convincing one because an increase in the number of available skilled planters would doubtless bring about reduced wage rates. Meanwhile, their rice fields are full of weeds despite herbicide applications which appear to be inadequate.

Another interesting phenomenon in the modernization of rice production is the increasing use and ownership of modern farm equipment and the corresponding decline in the possession of traditional farm implements such as the plow, harrow, cart, and sled (Table 2.20). Over a 5-year period there is a dramatic rise in the number of new equipment such as hand tractors, weeders, sprayers and even irrigation pumps.

Table 2.20. Ownership of farm tools and equipment (780 Laguna farmers), 1963-1968.

Tool/equipment owned	*1963*	*1968*
Four-wheel tractor	–	2
Hand tractor	9	61
Weeder	149	392
Sprayer	42	160
Irrigation pump	2	26
Plow	921	777
Harrow	657	634
Traditional cultivator	141	119
Sled	339	319
Cart	83	59

Source: FHDO, Rural Change in a Philippine Setting – A General Report on the Five-Year Project, a Study on Alternative Extension Approaches. University of the Philippines, College of Agriculture, 1971.

7. *Adoption Behavior as Farmer Expertise*

In practically all of the studies on adoption of farm innovations

here and abroad, adoption behavior is conceptualized as a dependent variable. The nature and rate of adoption are influenced by a number of factors, some of which are more important than others. Mangahas, in his study of the diffusion of HYV's among 866 farmers in Central Luzon, conceptualized adoption behavior as *farmer expertise* (a substitute variable for schooling). This farmer expertise variable was measured in terms of the proportion of recommended rice production practices adopted by the farmers. These practices include mechanical land preparation, seed selection, *dapog* method of seedbed preparation, straight-row planting, herbicides or rotary weeder, fertilizer application and use of insecticides. Having thus arrived at a measure of *farmer expertise* which is known as adoption behavior elsewhere, he tried to relate this and five other independent variables to the adoption of HYV's (Table 2.21). The other independent variables were farm size, owner-operatorship, interest rate, marketed surplus ratio and irrigation by pump. Farms were stratified into rainfed lowland, irrigated wet, and irrigated dry and then classified further in relation to participation or being a cooperator or non-cooperator with the government in the extension program on rice production, Mangahas' findings show that owner-operatorship and large farm size were not of great importance to the diffusion of HYV's. Conversely, tenancy and small farm size have not

Table 2.21. Linear probability functions for use of HYV's on specified farm types in Central Luzon, 1967-68.

Independent variables	*Rainfed*		*Irrigated wet season*		*Irrigated dry season*	
	Non-Cooperator	*Cooperator*	*Non-Cooperator*	*Cooperator*	*Non-Cooperator*	*Cooperator*
Expertise	0.114	0.469	0.689	0.720	0.780	0.985
Interest	−0.096	0.370	−0.001	−0.472	−0.531	−0.522
Tenure	0.013	−0.160	0.060	0.042	0.109	0.028
Size	0.005	0.074	−0.022	0.048	−0.083	−0.003
Pump	–	–	0.124	0.123	−0.008	−0.103
Sample size	343	69	236	218	89	117

Source: Mahar Mangahas, A Cross-Sectional Study of the Diffusion of New Rice Varieties in Central Luzon. Unpublished Ph.D. Thesis, University of Chicago, 1970.

been impediments to adoption; neither have non-commercialization or low marketed surplus ratios. Interest rate and adoption of HYV was in most cases negative and of fair size, suggesting that a decline in the cost of financing operating expenses contributed to the diffusion of HYV and the size of this contribution was related to initial favorability brought about by the presence of irrigation and participation in extension. Pump irrigation in contrast to gravity irrigation was a favorable factor to adoption. Age and years of schooling were not significantly related to farmer expertise or to the adoption of HYV. The most important variable explaining adoption was *farmer expertise* which showed a high degree of complimentarity with irrigation and participation in the government extension program. The "expertise" coefficient was highest for farmers who were cooperators and who grew rice in irrigated areas during the dry season (0.985). This implies that knowledge of one additional recommended practice out of seven contributes 13 percent to the probability of adoption.

Mangahas' major finding that *farmer expertise* is the most significant variable explaining adoption means that the *adopters of recommended practices are also the adopters of HYV's.* While *farmer expertise* in this sense is a good predictor of HYV adoption, it does not explain the findings of Sumayao and Pahud that the same farmers who planted both HYV and traditional varieties adopted more of the recommended practices for HYV than for the traditional. Under these circumstances, it is not logical to say that the same farmer has two different levels of expertise at the same time. It also seems very self-evident that the *adopters would adopt* and, therefore, the explanation for adoption behavior remains to be found elsewhere. For the question still is: How did farmer expertise come about or how does one explain the adoption of recommended practices (which is the operational definition of *farmer expertise*)?

8. *Correlates of Ethnic Group as a Factor in Adoption*

Data on ethnic group difference in adoption behavior are hard to come by. Fortunately, Battad's 1972 study of 213 rice farmers in Cotabato provides us interesting comparisons across ethnic groups. His respondents were composed of 62 Muslims, 50 Visayans, 51 Tagalogs and 50 Ilocanos residing in ten barrios of ten municipalities in Cotabato. Five respondents were chosen from each ethnic group from each barrio which was selected as to have all four ethnic groups present in sufficient numbers. The barrios and their

respective municipalities included are: Upper Paatan, Kabacan; Mulamote, Matalam; Dugong, Mlang; Amas, Kidapawan; Sinalukay, Buluan; Gansin, Tacurong; Tubon, Pigcawayan; Sindwingan, Libungan; Salunayan, Midasayap; and Tunggol, Pagalungan. Table 2.22 shows the comparative characteristics of the four groups of farmers.

Table 2.22. Cotabato rice farmers' personal, family and farm characteristics by ethnic group (213 farmers from 10 barrios in 10 municipalities), 1972,

	Muslim	*Visayan*	*Tagalog*	*Ilocano*
		– Percent –		
1. *Years of schooling*				
None	70	12	12	4
Primary grades	6	36	27	18
Intermediate grades	11	28	35	44
High school	8	24	20	20
College	5	–	6	14
Mean years	2.07	4.5	5.01	6.33
2. *Age*				
Mean years	40.09	42.40	45.65	40.60
3. *Average years of farming experience*	14.00	13.70	13.34	13.25
4. *Average years of residence in the barrio*	14.27	12.98	13.68	14.80
5. *Tenure status*				
Owner	97	38	66	52
Part-owner	–	–	–	–
Share tenant	3	38	34	44
Lessee	–	4	–	4
6. *Religion*				
Islam	100	–	–	–
Catholic	–	82	76	64
Protestant and others	–	18	24	36
7. *Size of household*				
1 – 3	24	4	23	22
4 – 6	53	70	51	36
7 – 9	18	24	22	30
10+	4	2	4	12
Mean	5.05	5.7	5.2	5.4
8. *No. of household members in farm operations*				
None	4	16	–	–
1 – 3	68	64	41	28

Table 2.22 (Continuation)

	Muslim	*Visayan*	*Tagalog*	*Ilocano*
4 – 6	26	20	55	60
7 – 9	–	–	4	10
10+	2	–	–	2
Mean	2.85	2.44	3.88	4.56
9. *Size of farm in hectares*				
0.25–1	42	52	45	18
1.25 – 2	38	30	35	56
2.25+	20	18	20	26
Mean	1.64	1.63	1.62	1.75
10. *Gross income*				
₱2500 and below	63	32	26	14
2501 – 5000	32	50	55	38
5001+	5	18	19	48
Mean income	₱2500	₱3400	₱3116	₱4869

Source: Fortunato A. Battad, Factors Associated with the Adoption of Rice Technology in Cotabato. Unpublished Ph. D. Thesis, University of the Philippines College of Agriculture, 1973.

The Ilocanos had the highest educational attainment, followed by the Tagalogs and the Visayans. The Muslims have had the least amount of formal schooling. In age, years of residence in the barrio and farming experience the four groups did not differ significantly despite the fact that the three groups were migrants. Landownership was highest (almost 100 percent) among the Muslims and the Visayans had the highest rate of tenancy. In household size, number of household members involved in farming operations, farm size and gross income, the Ilocanos reported the largest household, the largest farm and the highest gross income. In terms of irrigation, feeder roads and transportation facilities, the Muslims were less favored than the three Christian groups. The former had more farmers reporting unavailability of irrigation and feeder roads, poorer quality roads and unsatisfactory transportation (Table 2.23).

As far as exposure to new rice technology is concerned, the Muslims are well exposed as the three other groups to such things as use of HYV's, seed selection, seed treatment, use of farm machinery pest control and use of weedicides. They are less aware of germination test, straight-row planting and use of fertilizer (Table 2.24). In the trial and adoption stages, the proportion of Muslim

Table 2.23. Availability of irrigation and transportation to 213 Cotabato rice farmers by ethnic group.

	Muslim	*Visayan*	*Tagalog*	*Ilocano*
		–Percent–		
1. *Irrigation*				
Available	68	78	78	80
Not available	32	22	22	20
2. *Sources of irrigation water*				
Pump	13	2	16	10
Gravity	45	68	63	70
Rain	32	22	21	20
Creek	10	8	–	–
3. *Feeder roads and transportation*				
Available	81	100	100	100
Not available	19	–	–	–
4. *Quality of roads*				
Poor	20	–	2	6
Fair	71	48	90	86
Good	9	52	8	8
5. *Quality of transportation*				
Unsatisfactory	20	–	2	6
Satisfactory	70	52	94	90
Very satisfactory	10	48	4	4

Source: F.A. Battad, *op. cit.*

Table 2.24. Cotabato rice farmers' exposure to and adoption of new rice technology by ethnic group.

	Awareness				*Trial*				*Adoption*			
	Muslim	*Visayan*	*Tagalog*	*Ilocano*	*Muslim*	*Visayan*	*Tagalog*	*Ilocano*	*Muslim*	*Visayan*	*Tagalog*	*Ilocano*
A. *Rice Practices*						*–Percent–*						
Use of HYV	100	100	100	100	65	72	92	40	89	98	100	100
Seed selection	97	98	94	74	5	54	51	12	41	82	49	58
Germination test	39	88	67	64	3	46	25	8	3	78	29	48
Seed treatment	52	64	69	50	2	36	25	8	24	64	14	28
Use of farm machinery	98	100	100	92	11	20	43	24	50	20	71	70
Controlling pests	100	100	94	100	19	42	76	28	93	98	94	100
Straight-row planting	11	100	100	82	–	38	27	30	–	10	9	2
Use of fertilizer	62	100	100	94	9	52	49	35	8	88	78	94
Use of weedicides	100	100	100	94	11	54	69	34	94	94	82	94

Table 2.24. (Continuation)

B. *Farmers' Evaluation of HYV Compared to Local Varieties*

	Muslim	*Visayan*	*Tagalog*	*Ilocano*
			–Percent–	
1. More marketable	90	90	41	80
Less marketable	–	–	–	4
No difference	10	10	59	16
2. More productive	100	100	100	100
Less productive	–	–	–	–
No difference	–	–	–	–
3. More adaptable	42	82	40	92
Less adaptable	4	–	–	2
No difference	44	18	60	6
4. Easy to secure	70	100	90	98
Difficult to secure	30	–	10	2
5. Require more costly inputs	100	100	63	100
Require less costly inputs	–	–	37	–

Source: F. A. Battad, *op. cit.*

farmers who have tried and adopted new practices is also lower than for the Christians. In general, however, for all the four groups, the proportion of adopters is lower than those who are aware. It is likewise evident that farmers do not always pass through the trial stage before adoption. The proportions adopting directly without prior trial are quite high for eight of the nine practices. It is only in straight-row planting where there are more trials than adoptions. This practice is also the least popular among all four groups. None of the Muslim farmers used it and only 8 percent of them applied fertilizer despite the fact that 89 percent planted HYV's. The farmers are unanimous in their evaluation of HYV's being more productive than local varieties although they also recognize that more inputs are required. The Tagalogs more than any other group think that HYV's and local varieties do not differ in marketability and adaptability. Thirty-seven percent of them also say that HYV's require less costly inputs. More of the Muslims reported difficulty of securing seeds.

Since modern technology has to come from institutional sources through change agents, it is important to know the extent to which the four ethnic groups are exposed to such change agents. Table 2.25 very clearly shows that the Muslim farmers have minimal knowledge about and actual contact with change agents concerned

Table 2.25. Cotabato rice farmers' exposure to, knowledge of and contact with change agents concerned with rice production by ethnic group.

	Muslim		*Visayan*		*Tagalog*		*Ilocano*	
	N	%	*N*	%	*N*	%	*N*	%
1. Farmers *aware* of presence of change agents in the area	52	84	21	42	39	76	47	94
2. Those who are *aware* and *have contact* with change agent	7	13	18	80	37	95	46	98
3. *Number of change agents farmers know*						*Percent*		
None		84		60		74		6
1 – 4		16		40		26		88
5+		–		–		–		6
4. *Frequency of contact with change agents*								
Never		90		64		29		2
Very seldom		6		18		31		60
Often		4		18		40		38
5. Had *contact* with *rice expert* within last 3 years		3		38		30		90
6. Had attended gatherings related to rice production information		16		28		43		42
7. Farmers who know names of change agents and change agencies		10		36		70		92
8. Farmers who know religion of change agent		5		16		61		56
9. Farmers who know tribe of change agent		8		38		73		88
10. Farmers who know the change agent who resides in the barrio		13		36		61		92

Source: F. A. Battad, *op. cit.*

with rice production. This is so even if more Muslims than Visayans and Tagalogs are aware of their presence in the area. The Ilocanos lead the three other groups in terms of change agents known to them and frequency of contact. The Tagalogs come next to the Ilocanos. Both groups have higher proportions attending informational gatherings concerned with rice production. They also know more about the change agents, the agencies they belong to, their names, religion and tribal or regional identity. More of them know the change agent

who resides in the barrio. The inevitable conclusion is that the Ilocanos have the greatest exposure to, knowledge about, and contact with, change agents concerned with rice production. The Muslims have the least exposure.

Predictably, therefore, the Muslims have the highest proportion of low adopters, i.e., they have the least number of farmers adopting new production practices. Tagalogs and Ilocanos are the highest adopters (Table 2.26). The other variables reported in the same table will help explain the differentials in adoption behavior. The factors positively related to adoption are education, use of credit, higher

Table 2.26. Factors associated with adoption of rice practices by Cotabato farmers.

1. Ethnic Group		*Muslim*	*Visayan*	*Tagalog*	*Ilocano*
			– Percent –		
Low Adoption		66	27	10	20
High adoption		34	73	90	80
2. Education	*No. schooling*	*1-4 yrs.*	*5-6 yrs.*	*High school*	*College*
Low	58	22	26	19	9
High	42	78	74	81	91
3. Tenure status	*Owner*		*Share tenant*	*Lessee*	
Low	40		19	40	
High	60		81	60	
4. Size of farm	0.25 to 1.00	1.25 to 2.00	2.25 to 3.00	3.25 to 4.00	4.25+
Low	35	34	21	25	44
High	65	66	79	75	56
5. Number of other Household Members Participating in Farm operations	*None*		*1 – 3*	*4 – 6*	*7 – 10*
Low	75		41	13	0
High	25		59	87	100
6. Credit	*Did not borrow*		*Borrowed*		
Low	40		19		
High	60		81		
7. Availability of Irrigation	*Not available*		*Available*		
Low	63		23		
High	37		77		
8. Quality of Roads	*Poor*	*Fair*	*Good*		
Low	53	35	18		
High	47	65	82		
9. Quality of Transportation	*Unsatisfactory*	*Satisfactory*	*Very satisfactory*		
Low	50	36	16		
High	50	64	84		

Table 2.26 (Continuation)

10. Gross Income	₱2500 and below	₱2501-₱5000	₱5001 and above	
Low	55	30	2	
High	45	70	98	
11. Organizational Membership				
	None	*One*	*Two or more*	
Low	43	23	5	
High	57	77	95	
12. Contact with Rice Specialists				
	No contact	*Seldom*	*Often*	*Very often*
Low	39	35	21	8
High	61	65	79	92
13. Attendance in Informational Gatherings on Rice Production				
	Not attended		*Attended*	
Low	45		7	
High	55		93	
14. Use of Printed Media Relevant to Rice Production				
	Non-user		*User*	
Low	34		–	
High	66		100	

Source: F.A. Battad, *op. cit.*

gross income, availability of irrigation, better quality roads and transportation, membership in organizations, contact with rice specialists, attendance in informational gatherings and use of printed media on rice production and more household members helping in farm operations. Contrary to usual expectations but confirmatory to other findings previously cited, share tenants show higher adoption than owner-operators. Farm size has a positive relationship to adoption with bigger farms showing higher adoption up to a point. Beyond 4 hectares, adoption declines.

Looking back at previous tables, one can see that ethnic group *per se* is a very misleading explanation for differential adoption. For example, Muslims as shown in Table 2.26 have lower education, minimal contact with change agents concerned with rice production, less favorable irrigation, roads and transportation, and fewer members of their household involved in rice production. Among the Muslim farmers only 8 percent reported use of fertilizer. Since fertilizer requires a sizeable cash outlay, its low adoption is probably tied to the credit problem. Table 2.27 definitely points to the fact that although all Muslim farmers (98 percent) knew about credit sources, particularly the institutional ones, only 6 percent or four of them were actually able to borrow money compared to 40 to 60

Table 2.27. Cotabato rice farmers' awareness and use of credit.

	Muslim	*Visayan*	*Tagalog*	*Ilocano*
			Percent	
1. Farmers aware of credit facilities	98	100	98	86
2. Farmers able to borrow money	6	40	60	46
3. Farmers who think they can obtain loan on time, if needed	18	28	57	70
4. Known source of credit				

	Total Number	*Actual Sources Total Number*
Rural bank	77	21
Middlemen	6	4
Neighbors	26	12
Agric. Credit Adm.	20	15
Farmers' Cooperative Marketing Assoc.	28	5
Philippine National Bank	20	5
Development Bank of the Philippines	12	3
Government Service Insurance System	1	1
Landlord and/or Datu	15	6
Credit Union	1	1
Total mentioning known source of credit	206	Total who actually borrowed 73

Source: B.A. Battad, *op. cit.*

percent of the three Christian groups. When asked if they thought they could obtain a loan on time if needed, the Muslims were most pessimistic. Only 18 percent of them thought it could be done, compared with 70 percent of the Ilocanos, 57 percent of the Tagalogs and 28 percent of the Visayans. Of the 77 farmers from four groups who were actually able to borrow money, 87 percent said the loan procedures were simple but three out of the four Muslim farmers who obtained credit considered the procedures complicated and too much paper work was required. Half of those who borrowed did so at 8 percent or lower rate of interest. The other half paid 10 percent or higher. However, it is very significant that ease of obtaining loan is

the reason given by 62 percent of the borrowers for their choice of lender. Only 2 percent mentioned low interest as a consideration. One-fourth of them were recommended by the extension workers to the credit agency. Since Muslim farmers had minimal contact with change agents, this avenue to credit was certainly not available to them.

If recommended rice production practices were adopted, they are supposed to contribute to increased productivity. In Table 2.28, the Muslims show the lowest yield per hectare among the four groups. Their yields for both the high adopters and low adopters are lower than those of the three other groups. In general, they have the lowest adoption scores. What is intriguing in Table 2.28 is the farmers' evaluation of their 1970-71 crop compared with that of 1969-70. Although the Muslims have the lowest yields of the four groups, they have the highest proportion (76 percent) of farmers who said their production increased. The Ilocanos who have the highest actual yields have only 62 percent reporting increased production. Apparently the base year for comparison was much lower for the Muslims than for the Ilocanos. Increased production was attributed by the Muslims mostly to the shift to HYV and use of chemicals. On the other hand, the three Christian groups gave the credit mostly to the fertilizers used. As mentioned earlier, very few Muslims used fertilizer but 89 percent of them planted HYV's. Decrease in production was blamed on tungro and rat infestation and lack of water.

Regardless of reported increase or decrease in production, the farmers from all groups were unanimous in ranking rice as the most profitable enterprise compared to corn, vegetables or livestock. The Muslims have the lowest proportion of farmers who sell rice, 82 percent as against 100 percent, 94 percent and 86 percent for Ilocanos, Tagalogs and Visayans, respectively. Surprisingly, however, they seem to be able to obtain the highest price for their rice, followed by the Tagalogs, Ilocanos and Visayans. Their satisfaction with the price of rice relates closely with the actual price they have obtained from selling their rice, with the Muslims and Tagalogs being the most satisfied. One wonders why the Muslims and Tagalogs obtain better price for their rice when they have the same ways of marketing through purchasers who come to the barrio. Despite ownership of land for practically all the Muslim farmers and the better price they have been able to obtain for the rice they sell, their gross income is the lowest of the four groups.

Table 2.28. Cotabato rice farmers' production performance and marketing practices by ethnic group.

	Muslim	*Visayan*	*Tagalog*	*Ilocano*
1. Average yield in cavans per hectare, 1970-71				
High adopters	51.58	60.99	67.52	70.21
Low adopters	45.00	52.49	47.78	59.60
2. Farmers' evaluation of 1970-71 production compared to 1969-70			*—Percent—*	
Increased	76	70	65	62
Decreased	21	30	27	28
Same	3	—	8	10
3. Ranked rice crop as most profitable compared to corn, vegetables, livestock	100	100	100	100
4. Percent of farmers who sell rice	82	86	94	100
5. Price of rice per cavan			*—Percent—*	
₱20 and below	3	44	15	18
₱21 – ₱22	8	24	20	24
₱23+	89	32	65	58
6. Farmers' evaluation of rice price				
Satisfactory	90	79	94	72
Unsatisfactory	10	21	6	28
7. Ways of marketing rice				
Public market	8	5	—	6
Someone comes to the barrio to buy	92	95	100	94

Source: F.A. Battad, *op. cit.*

Another study which was conducted by Derongongan supports Battad's findings with respect to adoption behavior among Maranao farmers in Lanao del Sur. Adoption of recommended rice production practices was positively associated with level of education whether in English or Arabic, tenure status, number of family members working on the farm, leadership position, income level, membership in farmers' association, attendance in seminars, participation in extension activities, contact with extension workers, yield per hectare, and availability of irrigation. As in Battad's study, adoption was negatively associated with farm size. Unlike findings

elsewhere, owner-operators among Maranaos showed higher adoption scores than part owner-lessees and share tenants. This is the only study where evidences about ownership-operatorship and innovativeness fit nicely the hypothesis (Table 2.29). It is important to point out that except for ownership of land which was about 61 percent, including

Table 2.29. Factors associated with the adoption of recommended rice production practices among 160 Maranao farmers in Lanao del Sur (1972).

Adoption Scores				
	Level of Education in English			
	None	*1 – 6 years*		
Low (0–2)	90	42		
High (3–5)	10	58		
	100	100		
N	115	45		
	Level of Education in Arabic			
	None	*1 – 4 years*	*5-10*	
Low	90	80	43	
High	10	20	57	
	100	100	100	
	Tenure Status			
	Share tenant	*Lessee*	*Part-owner*	*Owner operator*
Low	92	80	79	63
High	8	20	21	37
	100	100	100	100
	No. of Family Members Working on the Farm			
	One	*Two*	*Three or more*	
Low	64	78	55	
High	36	22	45	
	100	100	100	
Adoption Score				
		Size of Farm		
	Below 1 ha.	*1 – 1.99*	*2 or more*	
Low	72	73	85	
High	28	27	15	
	100	100	100	
	Leadership Position			
	Non-Leader	*Leader*		
Low	81	60		
High	19	40		
	100	100		

Table 2.29 (Continuation)

	Income Level (pesos)		
	100 – 500	*500 – 2000*	*2000 & more*
Low	96	76	42
High	4	24	58
	100	100	100

	Membership in Farmers' Association	
	Non-member	*Member*
Low	82	60
High	18	40
	100	100

	Attendance in Seminars	
	No	*Yes*
Low	77	60
High	23	40
	100	100

	Participation in Extension Activities	
	No	*Yes*
Low	88	36
High	12	64
	100	100

	Contact with Extension Workers		
	Never	*1 – 3 times a month*	*4 – 6 times a month*
Low	83	67	33
High	17	33	67
	100	100	100

	Yield in Cavans per Hectare		
	15 – 30	*31 – 45*	*46 and above*
Low	97	80	49
High	3	20	51
	100	100	100

	Availability of Irrigation	
	Not available	*Available*
Low	84	27
High	16	73
	100	100

Source: Macaurog B. Derongongan, The Rice Production Programs in the Maranao Community. Unpublished Ph.D. Thesis, University of the Philippines, College of Agriculture, 1973.

part-owners, few of the Maranao rice farmers possessed the positive factors related to adoption. Only 14 percent had irrigated farms; 73 percent rated their roads as unsatisfactory; average education even in Arabic was 2 years; only 28 percent were aware of and used credit; 6 percent attended seminars; 23 percent participated in extension activities; but 82 percent never had contact with extension workers. About 76 percent used only two or less of the recommended practices and only 22 percent used HYV. Even less than in Battad's study, the Maranao farmers had only 1.7 average number of family members working on the farm although the average household size was 6.2. On the plus side, somehow the Muslim farmers seemed to obtain satisfactory price for their rice. This was reported in both of the studies.

In summary, ethnic group as a factor in adoption is not really ethnic group *per se* but a complex set of interrelated components which include differentials in infrastructure, availability of and access to resources, sources of information which influence adoption behavior, productivity and income. How these differentials come about is another question. One can ask, for example, why Muslims have less favorable irrigation, roads and transportation, lower educational attainment, less contact with change agents and minimal use of credit despite a high degree of awareness of such institutions. Why do Ilocanos have more household members helping in farm operations? Why do they have larger farms and greater access to rice production information? In other words, Battad's study tells us the correlates of ethnic groups as a factor in adoption but it does not explain how the four ethnic groups happened to differ in these correlates in the first place. One has to go much further and deeper, but definitely ethnic group identify *per se* is a misleading explanation of differential adoption behavior. Muslims are not low adopters of rice technology because they are Muslims but because of other correlates discussed above.

D. The National and Regional Patterns of Adoption of HYV's (1967-72)

Mangahas and Librero have summarized comprehensively the national and regional picture with respect to the adoption of HYV's.[50]

[50]Mahar Mangahas and Aida R. Librero, The High-Yielding Varieties of Rice in the Philippines: A Perspective. Discussion Paper No. 73-11, June 1973, Institute of Economic Development and Research, School of Economics, University of the Philippines.

Table 2.30. Area, production and yield per hectare of HYV (1967-1972) by region (Data from the Bureau of Agricultural Economics).

		Regions								
	Philippines	I	II	III	IV	V	VI	VII	VIII	IX
Area (thousand hectares)										
Total area harvested (all rice)										
1967-68	3,304	140.9	296.8	628.0	529.7	314.6	350.0	376.2	207.6	460.0
1968-69	3,332	129.2	272.0	608.8	538.1	300.3	382.9	384.9	248.6	467.2
1969-70	3,113	144.8	314.0	634.8	345.4	358.0	256.6	397.8	194.3	467.8
1970-71	3,112	127.4	361.2	641.5	387.0	298.5	253.0	420.6	213.0	410.6
1971-72	3,246	145.6	383.9	671.1	408.8	273.6	270.7	425.0	229.9	437.9
Percent of total area for HYV										
1967-68	21.2	29.8	9.9	16.9	25.1	27.3	19.2	14.2	14.1	33.7
1968-69	40.6	30.0	35.0	37.0	47.8	64.3	29.8	30.9	29.9	51.1
1969-70	43.5	29.4	39.1	36.8	43.1	57.7	44.4	40.7	28.1	57.5
1970-71	50.3	37.8	47.1	45.6	51.1	63.5	49.5	43.6	51.7	60.5
1971-72	56.3	47.4	41.6	62.0	57.2	73.4	50.0	60.6	59.3	49.6
Total area irrigated										
1967-68	1,309	75.8	130.9	360.3	238.5	134.6	101.8	80.7	41.1	145.3
1968-69	1,483	57.7	128.2	371.6	276.4	174.0	105.3	105.2	86.5	177.8
1969-70	1,346	76.5	211.9	237.3	153.5	164.0	64.0	72.4	56.1	220.1
1970-71	1,471	82.4	212.6	354.3	180.9	154.8	74.6	135.1	101.8	174.0
1971-72	1,332	82.7	198.6	289.3	175.1	137.4	73.7	100.0	95.6	179.5
Percent of irrigated area to total										
1967-68	39.6	53.8	44.1	57.4	45.0	42.8	29.1	21.4	19.8	31.6
1968-69	44.5	44.6	47.1	61.0	51.4	58.0	27.5	27.3	34.8	38.0
1969-70	43.2	52.8	67.5	51.6	44.4	45.8	24.9	18.2	28.9	47.0
1970-71	47.3	64.7	58.8	55.2	46.7	51.8	29.5	32.1	47.8	42.4
1971-72	41.0	56.8	51.7	43.1	42.8	50.2	27.2	23.5	41.6	40.9
Percent of irrigated area for HYV										
1967-68	34.0	36.5	20.3	26.0	39.0	36.1	35.8	25.4	52.3	53.1
1968-69	61.6	41.1	40.1	46.4	65.7	84.8	70.8	46.6	65.5	87.6
1969-70	61.4	34.6	52.4	46.0	67.5	82.4	67.3	51.1	53.8	86.1
1970-71	67.0	42.0	67.9	53.4	68.2	84.5	68.6	65.0	71.8	86.6
1971-72	73.4	51.1	64.8	70.4	83.4	86.0	69.5	79.0	77.6	74.2
Total production of all rice										
1967-68	103,700	5,715	10,930	26.370	15,230	9,861	6,756	12,530	4,222	12,401
1968-69	101,000	5,750	8,112	25,670	14,100	10,220	7,543	11,480	5,629	12,520
1969-70	118,900	5,217	11,670	32,100	13,980	12,620	6,358	13,660	6,345	17,010
1970-71	121,400	4,572	15,920	33,290	14,570	8,587	7,596	15,040	7,742	14,100
1971-72	115,900	5,381	15,410	24,470	13,210	12,390	7,299	13,630	7,641	16,480
HYV										
1967-68	27,550	2,408	1,538	5,275	4,727	8,386	1,714	1,964	682.9	5,404
1968-69	48,130	1,063	3,542	11,200	6,636	8,152	2,692	4,296	2,176	7,375
1969-70	58,330	1,938	5,186	12,910	6,866	9,188	3,153	5,557	2,056	11,470
1970-71	66,600	2,322	8,022	16,490	7,770	6,444	4,767	6,536	4,134	10,100
1971-72	73,460	3,240	7,169	15,960	8,624	9,941	4,018	9,170	5,054	10,280

Table 2.30 (Continuation)

Production (thousand cavans)										
Percent of HYV to total production										
1967-68	26.6	42.1	14.1	20.0	31.1	38.9	25.4	15.7	16.2	44.9
1968-69	40.6	35.9	43.7	43.6	47.1	79.8	35.7	37.4	38.6	58.9
1969-70	49.1	37.1	44.1	40.2	49.1	72.8	49.6	40.7	32.4	67.4
1970-71	54.8	50.8	50.4	49.5	53.3	75.0	62.8	43.4	53.4	71.7
1971-72	63.4	60.2	46.5	65.2	65.3	80.2	55.01	67.3	66.1	62.4
Yield per hectare (cavan/ha.)										
All rice										
1967-68	31.4	40.5	36.8	42.0	28.8	31.3	19.3	33.3	20.3	26.2
1968-69	30.3	44.5	29.8	42.2	26.2	34.0	19.7	29.8	22.8	26.8
1969-70	38.2	36.0	37.2	50.5	40.5	35.3	24.8	34.3	32.6	36.4
1970-71	39.0	35.9	44.1	51.9	37.7	28.8	30.0	35.8	36.4	34.4
1971-72	35.7	37.0	40.1	36.5	32.3	45.3	27.0	32.1	33.2	37.6
HYV										
1967-68	39.3	52.3	52.2	49.6	35.6	44.7	25.5	36.7	23.4	34.8
1968-69	35.6	53.3	37.1	47.7	26.3	42.2	23.6	36.1	29.2	30.9
1969-70	43.1	45.4	42.2	55.4	46.1	44.5	27.7	34.3	37.6	42.6
1970-71	42.5	48.3	47.2	56.3	39.3	34.0	38.1	35.7	35.7	40.7
1971-72	40.2	47.0	44.0	38.3	36.9	49.5	29.7	35.6	37.1	47.4
Other varieties										
1967-68	29.2	33.4	35.1	40.4	26.5	26.3	17.8	32.7	19.8	21.8
1968-69	26.7	40.7	25.9	37.7	26.1	19.3	18.0	27.0	19.8	22.5
1969-70	34.5	32.1	33.9	47.8	36.2	22.7	22.5	34.4	30.7	27.9
1970-71	35.4	28.4	41.3	48.2	36.0	19.7	22.2	35.8	35.1	24.6
1971-72	29.9	28.0	36.8	33.2	26.2	33.7	24.2	26.7	27.7	28.1
Proportion of HYV to OV										
1967-68	1.35	1.72	1.49	1.23	1.34	1.70	1.43	1.12	1.18	1.60
1968-69	1.33	1.31	1.43	1.32	1.01	2.19	1.31	1.34	1.47	1.37
1969-70	1.25	1.41	1.24	1.16	1.27	1.96	1.23	0.997	1.22	1.53
1970-71	1.20	1.70	1.14	1.17	1.09	1.73	1.72	0.997	1.07	1.65
1971-72	1.34	1.68	1.22	1.15	1.41	1.47	1.26	1.33	1.34	1.69
Increase in production attributable to HYV (In percent)*										
1967-68	7.42	21.34	4.87	3.89	8.53	19.11	8.26	1.70	2.54	20.22
1968-69	13.40	9.30	15.05	11.84	0.47	76.52	9.24	10.51	14.05	18.91
1969-70	10.88	12.17	9.38	5.89	11.64	55.39	10.21	0.12	6.18	30.48
1970-71	10.06	26.50	6.59	7.75	4.60	46.36	35.64	0.13	3.62	39.33
1971-72	19.42	32.23	9.15	9.30	23.45	34.50	11.50	20.00	20.16	34.22

Region I – Ilocos, (Abra, Batanes, Benguet, Mt. Province, Ilocos, La union) Mt.
Region II – Cagayan Valley (Cagayan, Isabela, Kalinga-Apayao, Ifugao, Nueva Vizcaya)
Region III – Central Luzon (Bataan, Bulacan, Nueva Ecija, Pampanga, Pangasinan, Tarlac, Zambales)
Region IV – Southern Tagalog (Batangas, Cavite, Laguna, Marinduque, Mindoro, Palawan, Quezon, Rizal)
Region V – Bicol (Albay, Camarines, Catanduanes, Masbate, Sorsogon)
Region VI – Eastern Visayas (Bohol, Leyte, Samar)
Region VII – Western Visayas (Aklan, Antique, Capiz, Iloilo, Negros, Romblon)
Region VIII – North and East Mindanao (Agusan, Bukidnon, Camiguin, Lanao, Misamis, Surigao)
Region IX – South and West Mindanao (Cotabato, Davao, Sulu, Zamboanga)

*Computed as the proportion of area in HYV multiplied by the proportionate yield differential of HYV to other varieties.

Source: M. Mangahas and A.R. Librero, *op. cit.,* Tables 1.2. to 1. 13.

Table 2.30 shows the following patterns:

(1) The total rice area harvested for the country has not changed for the five-year period, 1967-1972. If at all, it has declined slightly. However, the total area devoted to HYV increased by more than two and a half times, from 21 to 56 percent. This was accompanied by almost 8 percent increase in irrigated area relative to the total rice area from 39.6 in 1967-68 to 47.3 percent in 1971. The irrigated area declined to 41 percent in 1971-72 but the proportion of irrigated land planted to HYV doubled from 34 to 73.4 percent. The total production coming from HYV increased 2.4 times during the five-year period. Although the yield per hectare of HYV's was higher than that of other varieties, the HYV's themselves did not show any appreciable improvement in yield. The proportion of the increase in production which is attributable to HYV increased from 7.42 to 19.42 percent, but this can be interpreted as due to expansion of area devoted to HYV rather to yield improvements of HYV. Since the average yield of HYV is only about 40 cavans per hectare, there is considerable room for upward movement. Because average yields hide quite a bit of information, it would be important to obtain a picture of yield distribution, nationally and regionally. We need to know what proportion of the farms are in the low, medium or high yield levels as far as HYV's are concerned. The virtual plateau on national average yield for HYV must find some explanation in the light of potentials which the new rice seeds are supposed to possess.

(2) In order to make a more meaningful comparison of regional performance, average figures for the five-year period were computed for area, production and yield (Table 2.31). The initial adoption rate as proportion of total rice area was highest in Region IX (South and West Mindanao), followed by Region I (Ilocos); then Region V (Bicol); Region IV (Southern Luzon); and Region III (Central Luzon). By the fifth year, the two leading Regions IX and II had run out of steam with 47 and 49 percent of the total area, while Regions V, III and VII (West Visayas) outstripped them with 73, 62 and 60 percent, respectively, by 1971-72. Considering their starting adoption rate, Regions VII and VIII (North and East Mindanao) expanded the most in terms of proportion of total area planted to HYV. On the average, however, Table 2.31 shows that six of the nine regions did not differ much in rate of adoption. Region V (Bicol) led them all, followed by Region IX and then Region IV. It is also noteworthy

that the two regions in Mindanao (VIII and IX) registered the highest percentage of irrigated area (more than 50%) for HYV during the first year of adoption. The regional adoption patterns are contrary to what would be expected because the highest initial rates were reported for regions farthest from the center of innovation, which is Los Baños, Laguna in Southern Luzon (Region IV).

(3) The proportion of irrigated land to total area harvested did not change very much for the different regions except for Region VII where the irrigated area doubled from 19.8 to 41.6 percent. The least irrigated Regions are VI and VII (East and West Visayas) and they remained so during the years under study. These are mostly corn and sugar areas though.

(4) Table 2.32 shows that regions with the highest proportion of irrigated area are not those with the highest percent of irrigated area devoted to HYV. As a matter of fact, it is the reverse for Regions I, II and III. They were the three highest ranking regions for the former but lowest ranking for the latter. However, their rankings on percent irrigated area correspond o the rankings on yield per hectare for all rice, for HYV and for other varieties. Because Regions I, II and III obtained higher yields from other varieties than the other regions, the differential between HYV and other varieties was not great. This probably explains their relatively low rate of initial HYV adoption in 1967-68, their low ranking on the percent of irrigated area devoted to HYV and consequently, the lower percent of production increase which is attributable to HYV.

(5) Region V (Bicol) seems to have responded most to HYV's as indicated by the fact that it has the highest over-all adoption rate for the five-year period. It ranks second in average percentage of irrigated area devoted to HYV and first in the proportion of HYV to total production. It also exhibited the greatest yield differential between HYV and other varieties, hence it is also the region which showed the greatest increase in production attributed to HYV. Furthermore, although it started with a fairly high rate of adoption (third in rank), the expansion continued so as to attain a second rank in terms of increase in proportion of area devoted to HYV from 1967 to 1972. Region IX is likewise interesting for having topped in the initial adoption rate and for achieving second rank in productivity increase attributable to HYV. Although the average HYV yield for Region IX is only fifth, the difference between the HYV yield and that of other varieties is second to that of Bicol. If one were to go by press releases

Table 2.31. Average area, production and yield for 5-year period 1967-1972 by region.*

Region	Total area harvested (thousand hectares)	% of total area for HYV	Total area irri-gated (thousand hectares)	% irri-gated area to total	% irr-gated area to HYV	Total produc-tion of all rice (thousand cavans)	Total produc-tion of HYV (thousand cavans)	% of HYV to total produc-tion	Yield per hectare for all rice	Yield per hectare for HYV	per hectare for other varieties	Prop. of HYV to OV yield	In cease in pro-due to HYV (percent)	% of total area in HYV in 1967-68	Difference between percent total area 1967-68 & 1971-72
Philippines	3,221.4	42.38	1,388.2	43.12	59.40	112,180.0	54,814.0	46.9	34.92	40.14	31.14	1.29	12.34	21.2	35.1
I Ilocos	137.58	34,88	75.02	54.54	41.06	5,327.0	2.393.8	45.22	38.78	50.26	32.52	1.56	20.30	29.8	17.6
II Cagayan Valley	325.58	34.54	176.44	53.84	49.10	12,408.0	5,091.1	39.76	37.60	44.70	34.60	1.30	9.0	9.9	31.7
III Central Luzon	636.84	39.66	340.56	53.66	48.44	28,380.0	1,236.7	43.70	44.62	49.86	41.46	1.20	7.73	16.9	45.1
IV Southern Tagalog	441.80	44.86	204.88	46.06	64.04	14,218.0	6,925.0	49.18	33.10	36.84	30.20	1.22	9.37	25.1	32.1
V Bicol	309.00	57.24	152.94	49.72	74.76	10,735.6	7,512.2	69.34	34.94	42.98	24.34	1.81	46.37	27.3	46.1
VI Eastern Visayas	302.64	38.58	83.88	27.64	62.40	7,110.4	3,268.8	45.70	24.16	28.92	20.94	1.39	14.97	19.2	30.8
VII Western Visayas	400.90	38.00	98.68	24.50	53.42	13,268.0	5,504.6	40.90	33.06	35.68	31.32	1.15	6.39	14.2	46.4
VIII Northern & Eastern Mindanao	218.68	36.62	76.22	34.58	64.20	6,315.8	2,820.58	41.34	29.02	32.96	26.62	1.25	9.31	14.1	45.2
IX Southern & Western Mindanao	448.70	50.48	179.34	39.98	77.52	14,430.2	8.927.8	61.06	32.28	39.28	24.98	1.56	28.63	33.7	15.9

*Completed on the basis of data in Table 2.30 from Mahar Mangahas and Aida R. Liberro, *op. cit.*

Table 2.32. Ranking of regions by area, production and yield (using average for 5-year period), 1967-72.*

Region	Total area harvested	% of total area for HYV	Total area irrigated	% irrigated area to total	% irrigated area to HYV	Total production of all rice	Total production of HYV	% of HYV to total production	Yield per hectare for all rice	Yield per hectare for HYV	Yield per hectare for other varieties	Prop. of HYV to OV yield	Increase in production to to HYV	% of total area in HYV in 1967-68	Difference between total in HYV in 1967-68 and 1971-72
I	9	8	9	1	9	9	9	5	2	1	3	3	3	2	8
II	5	9	4	2	7	4	6	9	3	3	2	5	7	9	6
III	1	4	1	3	8	1	1	6	1	2	1	8	8	6	4
IV	3	3	2	5	3	3	4	3	5	6	5	7	5	4	5
V	6	1	5	4	2	6	3	1	4	4	8	1	1	3	2
VI	7	5	6	7	5	7	7	4	9	9	9	4	4	5	7
VII	4	6	7	9	6	5	5	8	6	7	4	9	9	7	1
VIII	8	7	8	7	4	8	8	7	8	8	6	6	6	8	3
IX	2	2	3	6	1	2	2	2	7	5	7	2	2	1	9

*Rankings are based on computed averages in Table 2.30 the basic data for which came from M. Mangahas and A. R. Librero, *op. cit.*

and stated priorities, he would expect Central Luzon and Southern Luzon (Regions III and IV) to lead all other places in adoption rates.

(6) In general, no one region enjoyed any special advantage by way of adopting the new seeds. For example, Region VI, which is more of a corn than a rice-growing area, had an average of 62 percent of its irrigated area devoted to HYV and even its percent of total area in HYV is almost the same as that of Region III (Central Luzon). As a matter of fact, Region VI's irrigated area planted to HYV (65%) is higher than that of Central Luzon, which had only 48 percent. The diffusion of HYV again gave no special advantage to Southern Luzon, the region of its origin.

3

Agricultural Extension Services and the Rice Farmer

Agricultural modernization depends to a large extent on the introduction of ingredients from outside the traditional world of the farmer. These include new and improved varieties of crops or livestock; better cultural practices which enhance and make the production processes more profitable; different ways of organizing for production; use of purchased rather than traditional inputs; an increasing reliance on production credit from formal institutional sources; more effective marketing channels; and in general, a greater interdependence with the outside world. This means that someone or some ways have to be found to bring these outside factors into the decision-making frame of the farmer so that they would become actual alternatives for him. Agricultural extension is one organizational device which has been set up to perform this function. For one reason or another, however, farmers in different parts of the country have varying degrees of exposure to agricultural extension services and they also tend to have different perceptions of agricultural extension agents. This chapter presents (a) a nation-wide as well as a regional picture of Filipino rice farmers' exposure to extension services and other sources of information; (b) farmers' perceptions of extension workers; and (c) some indications of the direct and indirect impact of agricultural extension on rice farming.

A. Rice Farmers' Exposure to Extension Services and Other Sources of Information

The first comprehensive data available on farmers' exposure to extension are provided by the June 1972 Integrated Agricultural Survey of the Bureau of Agricultural Economics. Tables 3.1 to 3.5 show the following trends:

(1) For the country as a whole, only 22 percent of the farms in the first cropping season and 25 percent in the second season had

been visited by the extension agents in the year 1971-72. The higher percentage of farms visited in the latter season may be explained by the fact that the number of farms cultivated is only more than half of those in the first season. Lack of irrigation facilities does not make it possible to grow two crops in many places. Considering the reduction in farms, one should expect a doubled coverage but the data show only a 3- percent increase in the number of farms visited. Since one visit per farm does not mean very much, we should look at the proportion of farms receiving three or more visits (Table 3.1). Only 9 and 11 percent received such frequency of visits for the first and second seasons, respectively. Although these figures are low, the effect of radiation from the farm of initial contact to those who have no direct exposure could offset this rather scanty coverage. Obviously, this has happened in the diffusion of the new seeds, the performance of which powered its own spread or its own demise, as in the case of varieties which proved susceptible to certain diseases and pests. The Bureau of Agricultural Extension's rough estimate is that they have one extension worker for every thousand farmers.

(2) Since rice farms are unevenly distributed in the different regions, there is an equity problem in terms of exposure to extension services in relation to concentration of farms in each region. Central Luzon, for example, which had almost 21 percent of the country's rice farms (the highest of all regions) in 1971 had less than 20 percent of the farms visited by extension agents. This rather scanty exposure of Central Luzon farms to extension is surprising in the light of the land reform program's concentration in the area and the highest priority which has always been placed on the region as far as rice production programs are concerned. On the other hand, Northern and Eastern Mindanao which had the smallest share of the country's rice farms (6 percent) reported that 45 percent of their farms had been visited. The situation with respect to Ilocos is similar. Bicol seems to have a fair share of extension exposure relative to its share of the country's rice farms.

(3) Visits by extension workers tended to be either *once* (41 percent) or *three or more times* (39 percent). Those visited twice make up only about 20 percent. Apparently, the mode of operation is either one cursory visit or a more intensive work with farmers. Because of his work load, the extension agent is probably forced to narrow down his efforts to fewer farmers. Almost 60 percent of his farm visits are to provide technical advice, which is usually defined as his major function.

Table 3.1. Rice Production Program: Farms reporting on extension worker visits by number and purpose of visits.

Region	No. of visits			Purpose of visit							
1st Semester July-Dec. 1971	Total no. of rice farms	No. of farms visited by extension	Prop. of farms visited to total	Prop. of farms visited once to total visited	Prop. of farms visited twice to total visited	Prop. of farms visited 3 or more times to total visited	Prop. of farms visited for follow-up	Prop. of farms visited for technical advice	Prop. of farms visited for other reasons	Prop. of farms visited 3 or more times to total no. of farms	Percent of farms located in each region
	A	B	B/A	B							
Philippines	1,479,434	333,726	22.56	40.92	19.84	39.24	20.04	58.18	21.79	8.9	
Ilocos	129,064	38,019	29.32	30.52	13.49	55.60	35.39	30.95	33.66	16.4	8.8
Cagayan Valley	96,618	16,544	17.12	47.08	6.86	46.06	22.94	54.92	22.44	7.9	6.5
Central Luzon	307,088	58,879	19.17	58.29	18.22	27.54	20.94	60.26	18.79	5.3	20.8
Southern Tagalog	180,675	50,663	28.04	42.16	33.01	24.83	27.73	62.48	9.79	7.0	12.2
Bicol	144,477	31,562	21.84	28.57	21.81	49.61	11.74	61.72	26.55	10.8	9.8
Eastern Visayas	145,296	30,954	21.30	45.08	19.72	35.20	20.11	48.76	31.14	7.5	9.8
Western Visayas	221,817	39,251	17.70	39.31	20.95	39.73	11.23	66.46	23.06	7.0	15.0
Northern & Eastern Mindanao	89,643	40,604	45.30	32.49	19.24	48.27	11.11	68.71	20.19	21.9	6.1
Southern & Western Mindanao	164,156	27,250	16.60	45.09	12.69	42.22	16.11	66.26	17.63	7.0	11.1

Table 3.1 (Continuation)

2nd Semester Jan.-June 1972	Total no. of rice farms	No. of farms visited by extension	Prop. of farms visited to total	Prop. of farms visited once to total visited	Prop. of farms visited twice to total visited	Prop. of farms visited 3 or more times to total visited	Prop. of farms visited for follow-up	Prop. of farms visited for technical advice	Prop. of farms visited for other reasons	Prop. of farms visited 3 or more times to total no. of farms	Percent of farms located in each region
Philippines	829,172	207,377	25.01	40.22	16.14	43.64	14.22	58.52	27.26	10.9	–
Ilocos	34,193	8,246	24.12	64.36	6.98	28.66	6.18	24.10	69.72	6.9	4.1
Cagayan Valley	116,816	18,812	16.10	17.50	27.34	55.16	27.92	42.89	29.18	8.9	14.1
Central Luzon	73,984	16,313	22.05	42.52	13.61	43.87	11.59	66.99	21.42	9.7	8.9
Southern Tagalog	91,107	33,148	36.38	25.23	17.72	57.05	9.92	67.14	22.94	20.1	11.0
Bicol	109.141	30,695	28.12	35.30	14.32	50.39	11.38	43.15	45.47	14.2	13.2
Eastern Visayas	147,685	29,904	20.25	54.99	10.18	34.83	12.76	62.78	24.46	7.1	17.8
Western Visayas	96,826	22,212	22.94	44.62	18.81	36.57	25.54	62.64	11.82	8.4	11.7
Northern & Eastern Mindanao	69,506	27,045	38.91	39.97	22.48	37.54	16.72	61.79	21.49	11.3	8.4
Southern & Western Mindanao	89,914	21,002	23.36	54.82	9.34	35.84	4.99	73.69	21.31	8.4	10.8

Source: Bureau of Agricultural Economics Integrated Agricultural Survey (1971-72).

(4) For an extension agent it would be ideal if the farmers visited his office to consult with him regarding their problems rather than for him to go to each farm. In practice, only about 12 percent of the rice farmers took the initiative of visiting the extension worker's office (Table 3.2). Their major reason for doing so was to seek advice on pest control. This implies that the visit was prompted by the occurrence of pest and disease as was the case of the *tungro* virus infestation in 1971-72. Those who did not visit the extension agent's office had quite revealing reasons (Table 3.3). About one-fourth said it was not *necessary* and more than 40 percent indicated they were *too busy with farm work* to make the visit. Almost 20 percent gave no local office as their reason. The first two reasons cited can be interpreted in two ways: either the farmers do not feel the need to consult the extension worker because they know what to do with their farm or they do not see much value in going to the extension office at the expense of taking time out from their farm work. At any rate, what is suggested is a need to "sell" extension service to the farmers. They must perceive something worth-while before they would consider it necessary and worth the sacrifice of time. Of course, if it is the extension worker who visits the farm, there is no expenditure of time and effort on the part of the farmer.

(5) Table 3.4 provides data which offer another explanation for farmers' feeling that it is not necessary to visit the extension office. More than 80 percent of the total rice farmers cited information sources other than the extension worker. The most frequently cited other sources was radio (about 40 percent), followed by neighbors (about 25 percent). Cooperatives and rural banks played a very minor role, while other sources were mentioned by more than 15 percent. Western Visayas, Southern and Western Mindanao led the other regions in the use of the radio as a source of information. Mindanao and Ilocos Regions also showed more reliance than other regions on information from neighbors.

The high percentage of rice farmers reporting use of the radio as source of information is indeed encouraging. Its potential is further substantiated by another nation-wide study which focused on farmers' sources of market price information (Table 3.5). About one-fourth of the farmers reported radio as their source. Newspapers and magazines were hardly used for this purpose. Southern Tagalog showed the highest use, although only 5 percent. This region also indicated the highest proportion using other sources such as merchants, buyers,

Table 3.2 Rice farmers reporting on extension services who visited government offices and purpose of visit.

1st Semester July-Dec. 1971	*Total no. of rice farms*	*Total no. of farmers who visited gov't. offices*	*Proportion of total farmers who visited*	*Seek advice on pest control*	*% of those who visited*	*Other purposes*	*% of those who visited*
	A	B	B/A	No. (C)	C/B	No. (D)	D/B
Philippines	1,479,434	169,428	11.45	122,581	72.35	46,847	27.65
Ilocos	129,664	9,835	7.58	7,006	71.24	2,829	28.76
Cagayan Valley	96,618	9,541	9.87	4,268	44.73	5,273	55.27
Central Luzon	307,088	26,142	8.51	17.562	67.18	8.580	32.82
Southern Tagalog	180,675	18,312	10.14	15,334	83.74	2,978	16.26
Bicol	144,471	24,823	17.18	17,529	70.64	7,294	29.38
Eastern Visayas	143,296	10,372	7.14	6,601	63.64	3,771	36.36
Western Visayas	221,817	21,229	9.57	13,909	65.52	7,320	34.48
Northern & Eastern Mindanao	89,643	25,256	28.17	22,589	89.44	2,667	10.56
Southern & Western Mindanao	164,156	23,918	14.57	17,783	74.35	6,135	25.65

Table 3.2 (Continuation)

2nd Semester Jan.-June 1972	Total no. of rice farms	Total no. of farmers who visited gov't. offices	Proportion of total farmers who visited	Seek advice on pest control	% of those who visited	Other purposes	% of those who visited
	A	B	B/A	No. (C.)	C/B	No. (D)	D/B
Philippines	829,172	102,404	12.35	71,109	69.44	31,295	30.56
Ilocos	34,193	1,630	4.77	783	48.04	847	51.96
Cagayan Valley	116,816	7,927	6.79	3,417	43.11	4,510	56.89
Central Luzon	73,984	8,824	11.93	5,959	67.53	2,865	32.47
Southern Tagalog	91,107	13,384	14.69	10,549	78.82	2,835	21.18
Bicol	109,141	20,005	18.33	13,402	66.99	6,603	33.01
Eastern Visayas	147,685	10,218	6.93	6,722	65.79	3,496	34.21
Western Visayas	96,826	12,437	12.84	9,670	77.75	2,767	22.25
Northern & Eastern Mindanao	69,506	13,131	18.89	10,599	80.72	2,532	19.28
Southern & Western Mindanao	89,914	14,848	16.51	10.008	67.40	4,840	32.60

Source: Bureau of Agricultural Economics Integrated Agricultural Survey (1971-72).

Table 3.3. Rice farmers reporting on extension services who did not visit government offices.

1st Semester July-Dec. 1971	*No. of rice farmers who did not visit*	*Reasons for not Visiting*			
		Prop. who said no local office	*Prop. who said not necessary*	*Prop. who said busy with farm work*	*Prop. who gave other reasons*
Philippines	1,234,305	18.0	25.4	45.6	11.0
Ilocos	115,649	12.0	22.2	51.4	14.4
Cagayan Valley	144,389	61.2	12.4	20.8	5.5
Central Luzon	236,734	12.3	20.3	47.6	19.8
Southern Tagalog	131,815	4.9	41.9	45.0	8.2
Bicol	107,353	6.7	25.0	53.9	14.4
Eastern Visayas	117,357	10.8	33.3	55.8	0.1
Western Visayas	188,843	11.7	30.3	51.0	7.0
Northern & Eastern Mindanao	59,612	22.0	24.8	45.4	7.9
Southern & Western Mindanao	132,553	22.1	21.5	41.4	15.0

Table 3.3 (Continuation)

2nd Semester Jan.-June 1972	*No. of rice farmers who did not visit*	*Prop. who said no local office*	*Prop. who said not necessary*	*Prop. who said busy with farm work*	*Prop. who gave other reasons*
Philippines	693,516	12.9	25.1	43.8	18.3
Ilocos	30,332	13.1	16.5	48.5	21.8
Cagayan Valley	107,741	19.1	19.5	33.9	27.5
Central Luzon	64,691	7.8	19.4	29.7	43.1
Southern Tagalog	76,722	4.6	25.1	41.8	28.4
Bicol	83,807	4.6	29.6	51.9	13.9
Eastern Visayas	126,276	13.1	31.5	48.7	6.7
Western Visayas	80,631	6.8	32.1	56.8	4.3
Northern & Eastern Mindanao	53,490	26.4	19.5	44.6	9.4
Southern & Western Mindanao	69,826	22.9	21.8	37.6	17.6

Source: Bureau of Agricultural Economics Integrated Agricultural Survey 1971-72.

Table 3.4 Rice farmers reporting sources of information other than extension workers.

Region	Total reporting information sources other than extension agent	% of Total farmers citing information source other than extension	Percent of Those Reporting Other Information Sources Who Mentioned				
			Radio	Neighbors	Cooperatives	Rural Banks	Others
1st Sem: July – Dec. 1971							
Philippines	1,226,529	82.9	46.1(38.2)	28.9(24.0)	5.2(4.3)	(2.3(1.9)	17.5(14.5)
Ilocos	112,582	86.8	48.2(41.8)	34.3(29.8)	2.4(2.1)	1.2(1.0)	14.0(12.1)
Cagayan Valley	83,630	86.6	38.0(32.9)	24.3(21.0)	1.1(1.0)	0.6(0.5)	36.0(31.1)
Central Luzon	262,876	85.6	35.0(30.0)	26.4(22.6)	10.5(9.0)	3.9(3.3)	24.3(20.8)
Southern Tagalog	150,127	83.1	47.5(39.5)	28.3(23.5)	5.0(4.2)	5.3(4.4)	13.9(11.6)
Bicol	132,176	91.5	44.2(40.5)	28.0(25.7)	8.3(7.6)	3.4(3.1)	16.0(14.7)
Eastern Visayas	127,729	87.9	37.3(32.1)	29.1(25.6)	5.0(4.4)	1.3(1.1)	27.3(24.0)
Western Visayas	173,126	78.1	64.9(50.6)	23.8(18.6)	0.9(0.7)	0.7(0.6)	9.7(7.6)
Northern & Eastern Mindanao	65,941	73.6	45.3(33.3)	40.6(29.9)	7.2(5.3)	0.7(0.5)	6.2(4.2)
Southern & Western Mindanao	118,252	72.0	57.0(41.0)	35.5(25.6)	0.9(0.6)	0.5(0.3)	6.2(4.5)

Table 3.4 (Continuation)

Region	Total reporting information sources other than extension agent	% of Total farmers citing information source other than extension	Percent of Those Reporting Other Information Sources Who Mentioned				
			Radio	Neighbors	Cooperatives	Rural Banks	Others
2nd Sem.: Jan.-June 1972							
Philippines	689,569	83.2	49.4(41.1)	28.2(23.4)	2.3(1.9)	0.8(0.7)	19.3(16.0)
Ilocos	30,804	90.1	35.1(31.6)	42.4(38.2)	4.7(4.3)	6.9(6.2)	10.8(9.7)
Cagayan	108,312	92.7	53.9(50.0)	12.4(16.5)	0.6(0.6)	– –	33.0(30.6)
Central Luzon	73,497	99.3	34.3(34.1)	21.8(21.7)	1.4(1.4)	0.5(0.5)	42.0(41.7)
Southern Tagalog	70,208	77.1	38.3(29.5)	31.3(24.2)	2.2(1.7)	0.6(0.5)	27.5(21.2)
Bicol	88,644	81.2	56.8(46.2)	31.2(25.3)	1.9(1.5)	1.1(0.9)	9.1(7.4)
Eastern Visayas	119,938	81.2	48.0(39.9)	35.3(28.7)	1.5(1.2)	0.1(0.0)	15.2(12.3)
Western Visayas	5,435	88.2	61.4(54.2)	24.6(21.7)	1.3(1.2)	1.5(1.3)	11.2(9.8)
Northern & Eastern Mindanao	52,059	74.9	48.8(36.6)	34.3(25.7)	9.9(7.4)	0.8(0.6)	6.2(4.6)
Southern & Western Mindanao	60,672	67.5	55.2(37.3)	34.4(23.2)	2.9(2.0)	0.1(0.0)	7.4(5.0)

Source: Bureau of Agricultural Economics Integrated Agricultural Survey (1971-72).
Figures in parenthesis indicate percent of total farmers (1,479,434) who reported information sources other than the extension worker.

Table 3.5. Farmers reporting: by region and sources of market price information, Philippines 1969 and 1970.

Region	Radio	Newspapers and magazines	Fellow farmers	Combination	Others*	No report	Total
			Two-year Average of Farmers in Percent				
Philippines	23	3	30	30	9	5	100
Ilocos	12	4	34	31	15	4	100
Cagayan Valley	16	4	42	24	5	9	100
Central Luzon	23	3	23	39	9	3	100
Southern Tagalog	18	5	22	37	16	2	100
Bicol	27	2	36	20	9	6	100
Eastern Visayas	21	1	25	38	3	12	100
Western Visayas	26	4	34	27	6	3	100
Northern & Eastern Mindanao	28	3	44	7	12	6	100
Southern & Western Mindanao	30	3	35	21	8	3	100

*Includes merchants, buyers, markets, sales agents, dealers, etc.

Source: R. C. Alcacbupas and C. C. Olalo, An Evaluation of the Media Dissemination of Market Prices of Agricultural Commodities, 1969 & 1970, *Philippine Agricultural Situation,* Vol. IX, No. 2, April-June 1972.

etc. Eastern Visayas topped all regions in terms of "no report," followed by Cagayan Valley. This means that farmers in these two regions were the least exposed to market price information or were the least informed on this matter. Southern Tagalog had only 2 percent of "no report" which probably means greatest proximity to all centers of information and therefore greatest exposure.

Farmers were most interested in the prices of three commodities, rice, corn and coconut. Other encouraging notes on the use of the radio are evident in the decline of non-listeners to radio market price reports from 65 percent in 1969 to 28 percent in 1970. In general, there was a growing interest as indicated by all respondents in 1970 expressing a desire for market price information. In 1969, about 38 percent of them did not care for such information. The importance of interpersonal communication in combination with mass media was emphasized by the authors of the study, since there is a prior need to "educate" farmers on the usefulness of timely market price information before they would find a reason for turning to the media for this information. The Sta. Iglesia and Getubig study provides some indication of the extent to which listeners of farm price broadcasts use the information.[1] Of the 143 farmers interviewed in Misamis Oriental, 59 percent used the information and 41 percent did not. The respondents used the information by selling elsewhere if the price offered was lower, haggling with buyers and waiting for a better price. Confidence in the accuracy of the price broadcast affected farmers' listening to and subsequent use of the information. About 56 percent thought it was *accurate,* 25 percent said *inaccurate,* and the rest did not know.

Although personal sources such as extension workers and neighbors remain to be important, the radio seemed to have assumed greater significance. This is an improvement over the earlier indications on the minimal role of mass media in the dissemination of information on new technology. For example, Frio found that in spite of broadcasts of IR-8 information over two radio stations and placement of posters and billboards at strategic points, only 2.5 percent of the 80 farmers in the community under study reported hearing about IR-8 through these channels. This was so despite a high percentage of radio ownership and listenership.[2] Pablico's study of the adoption of the hand tractor also revealed that in spite of mass

[1] J. C. Sta. Iglesia and I. P. Getubig, Jr., Radio Broadcast of Farm Product Prices and Its Farmer Listeners, *Philippine Agricultural Situation,* Vol. IX, April-June 1972, No. 2.

[2] Antonio S. Frio, *op. cit.*

media publicity, neighbors, tractor renters, salesmen, and dealers were the major sources of information.[3]

Other studies likewise showed that information on agricultural innovations — regardless of state in the adoption process — was obtained predominantly from personal sources and to a more limited extent through institutional and extension sources.[4] Bueno classified personal sources into personal cosmopolite (extension workers, agricultural storeowners, landlords, other farmers) all of whom come from outside the barrio, and personal localite (co-farmers, neighbors, relatives, other people from within the barrio). Early adopters tend to obtain information from cosmopolite personal sources. Once the innovation has entered the barrio, localites become the predominant sources. In a more economically advanced area, for example, most farmers heard of new rice varieties from neighbors although the earliest adopters obtained their information from an extension worker or from a managing landlord.[5] Dealers provided more information for insecticides, rodenticides, rotary weeders and fertilizers than on other practices.[6]

Longitudinal studies show a definite trend toward extension workers and other technically trained persons as sources of farming information. Conversely, there was a decline in the number of farmers depending on their own expertise or of their co-farmers.[7] As has been previously cited, the radio seems to be gaining ground as a source of agricultural information. This may be explained by the increased input of agriculturally relevant programs from radio stations and the relative unavailability of extension workers in the face of high-level awareness through demonstration effects of potentials offered by new agricultural technology. This latter explanation is corroborated in Feliciano's study of traditional barrios. Where there existed "change-readiness" among farmers, that

[3]Sosimo Ma. Pablico, The Process of Adoption of the Hand Tractor and the Role of Communicating Agents in a Philippine Rural Setting. Unpublished B.S. Agriculture Thesis, U.P. College of Agriculture, April, 1968.

[4]Hsueh-Yi Lu, *op. cit.;* Pedro B. Bueno, The Role of Mass Media in the Adoption of 2, 4-D, in Two Laguna Barrios. Unpublished B.S. Agriculture Thesis, U.P. College of Agriculture, 1966.

[5]David S. H. Liao, Studies on Adoption of New Rice Varieties. Paper presented at the International Rice Research Institute Seminar, November 9, 1968.

[6]Hsueh-Yi Lu, *op cit.;* A.M. de Guzman and C. M. Dimaano, *op. cit.;* and S. L. Pahud, *op. cit.*

[7]Farm and Home Development Office, Rural Change in a Philippine Setting, *op. cit.;* and G. T. Castillo, *et al.,* The Green Revolution at the Village Level: A Philippine Case Study. Paper presented at the International Congress of Orientalists, Canberra, Australia, Jan. 1971.

is to say, when there was a keenly felt need for a specific new practice, mass media were able to trigger trial and/or adoption. Thus 18 out of 198 respondents adopted a new practice after reading or hearing about it. One farmer who long wanted to own a knapsack sprayer decided to buy one after having heard its merits proclaimed over the radio; another farmer who had accepted the idea of fertilizing for greater crop yield bought Atlas fertilizer right away after reading its advertisement in *Liwayway* magazine.[8] Mass media, in other words, tend to function more as reinforcers or triggers for action after personal sources have made potential adopters aware of or interested in the innovation.

This phenomenon was further observed in Mercado's intensive analysis of communication strategies in the diffusion of the new rice varieties. His conclusions are as follows:

> "After knowing but before planting IR-8, farmers who were more exposed to extension officers showed significantly greater increase in information-seeking from personal sources than the less exposed to the same sources of information.
>
> "Likewise, farmers who were more exposed to extension officers showed significantly greater increase in information-seeking from their change agent than the less exposed farmers.
>
> "The farmers who were more exposed to extension officers also showed a greater increase in information-seeking from group sources than the less exposed farmers.
>
> "Also, the higher the level of exposure to extension officers, the greater the increase in information-seeking from farmers' meetings.
>
> "Information-seeking from mass media sources was also higher among the highly exposed than the farmers less exposed to extension officers.
>
> "Information-seeking from radio increased with exposure to extension officers.
>
> "Even information-giving was higher among the highly exposed than the less exposed farmers to extension officers.
>
> "The study also revealed that farmers who were more exposed to extension officers followed more cultural practices needed by IR-8 than the less exposed farmers.
>
> "Finally, the study showed the higher the level of exposure to extension officers, the faster the rate of adoption of IR-8.

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[8]Gloria D. Feliciano, The Flow of Information: Some Emerging Patterns in Selected Philippine Barrios. Seminar paper presented at the International Rice Research Institute, June 10, 1965, Communications Studies Series 2, U.P. Institute of Mass Communications, Diliman, Quezon City, 1965-67.

> "All told, the data indicated that after knowing but before planting IR-8, the higher the level of exposure to extension officers, the faster the rate of adoption of IR-8 and the adoption of the rice variety and the cultural practices that go with it."[9]

Mercado's findings on the positive relationship between information-giving to other farmers and exposure to extension officers are quite encouraging because other studies showed evidence of *information hoarding* among recipients or bearers of new information. For a variety of reasons, farmers may wish to have a monopoly of innovation. For example, of 199 farmers interviewed in Feliciano's study, 56 did not as a general rule shared agricultural news with their wives because they believed that "the woman has no secrets." Nor did they tell their fellow farmers. The motive for this "hoarding" of newly obtained information seems to derive from the fact that the farmer

> "cannot take the risk of being embarrassed or ridiculed if the new practice fails. The farmer is a doubting Thomas; he is not sure it is really good until he has tried it; further, the farmer is not sure it is important enough to others until he tries it and succeeds, and sees the other farmers' favorable reactions to his success. Also, being a recipient of new technological information bolsters the farmer's ego; he's got an edge over the other farmers now, so why tell them? Furthermore, it is the farmer's *suwerte* or good fortune. His neighbors will have it too, for life is a wheel of fortune anyway, so why not let them wait? They will have their turn."[10]

A more general communication pattern is the tendency of farmers to seek or receive information rather than to give it as shown among farmers in seven villages where improved rice varieties were being introduced in 1965. Of the 187 farmers interviewed who adopted the improved seeds primarily from extension workers, only 22 percent discussed the innovation with neighbors or with other farmers. And even in this discussion, the data do not distinguish whether the initiative came from other farmers or from the recipient of the seeds.[11] In other words, was the innovation shared voluntarily by the recipient or was it discussed only because the other farmers deliberately sought it?

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[9]Cesar M. Mercado, Communication Strategies, Exposure to Extension Officer, and Their Impact on Launching the 1967 'Green Revolution' in the Philippines, *Philippine Journal of Communication Studies,* Vol. II No. 1, June 1972, pp. 37-58.

[10]G. D. Feliciano, *op. cit.*

[11]Unpublished data from the pilot study of a cooperative approach to rural development. Farm and Home Development Office, U.P. College of Agriculture.

Being secretive about agricultural news can be compared to the "businessman's trade secret" in the competitive market. The desire to receive the earliest releases of the most recent rice varieties is directly related to the opportunity to plant it for seed which will then command a premium price in the community. The farmer who succeeds in getting even a handful of these early seeds is not about to part with any of it. Of course, after the first harvest, his secret is automatically shared. Concealing agricultural information is usually a temporary situation and when practiced by the same individuals, it is liable to retaliatory measures. After all, who knows whether the farmer presently denied the information may in the future be the bearer or pioneer recipient of something new? He, too, can "hoard" the innovation.

Mercado's findings on tendency to share information among those more exposed to the extension worker may be explained in a number of ways:

(1) Extension workers are very much aware of farmers who are *information-dead-ends* and, therefore, deliberately select farmer-cooperators who are more likely to share rather than hoard the innovation.

(2) In the case of HYV's, the demonstration effects and the variety of channels and sources might have rendered ineffective or very temporary whatever "innovation-hoarding" tendencies there might have been among farmers exposed to extension workers.

(3) Being the "bearer of what is new" has become prestigious rather than ridiculous, partly because of greater confidence in it. Therefore, there might be more to gain sharing than in hoarding the information they possess.

(4) With greater exposure to extension workers, there is more "credible" information to pass on to other farmers.

Considering the low ratio of extension workers to farmers, if the farmers most exposed to them were to hoard agricultural information from this source, extension work would have the net effect of supporting those farmers who are a little bit more progressive and prejudicing the interest of those who need extension services most.

B. Farmer's Perceptions of Extension Workers

Since the extension worker is considered as the link between the products of research and the farmers, their perceptions and

acceptance of the worker is crucial. In the present land reform program, for example, as de los Reyes and Lynch point out: "the principal element in the program's service-delivery system is the extension worker."[12] As officially defined, the farm management technician's (FMT) job is to "disseminate technical information to farmers and to demonstrate improved farm management practices and techniques (and/or help subject-matter specialists in conducting applied researches; and work with individual farmers in farm planning and budgeting, guide them in the proper conduct of farm business and recommend approval of the lessee's loan and work out schedule of repayment)."

When the farmers were asked about their expectations of an ideal farm management technician, de los Reyes and Lynch found that:

"The highest-ranked quality of a good FMT is competence; all respondents expect that the ideal FMT will be well-versed in modern agricultural practices. Second, he will be in frequent contact with the farmers, which they think requires his living in the barrio where he is assigned. The third quality desired of a good FMT is his being a good adviser. He is also expected to be courteous and friendly; solicitous or helpful in general; industrious and efficient in fulfilling his duties in the barrio; able to provide for farm needs; and a good mediator."

These expectations are very significant indeed because "the FMT is supposed to be one of the lessee's strongest links with the land-reform program and its services." The same study showed that only 50 to 60 percent of the lessees have any kind of work-relationship with an FMT. The rice farmers' expectations of technical competence and of frequent contact from the FMT reveal a growing demand for competent extension services, which is not unrelated to their responsiveness to new technology associated with agricultural extension. The implications of these demands on the quality and quantity of extension workers are quite obvious.

There is an interesting piece of evidence which is relevant to extension worker's competence. Contado found a statistically significant inverse relationship between technical competence and number of years the farm management technician had been in his present station. Positive correlation, however, was found between number of years he had been a farm management technician and authoritarian personality. Contado concludes that "the longer the change agent is in the service and in his present station and the more autocratic he is,

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[12] Romana P. de los Reyes and Frank Lynch, Reluctant Rebels: Leasehold Converts in Nueva Ecija, *Philippine Sociological Review,* Vol. 20, Nos. 1-2, Jan.-April 1972, pp. 7-78.

the less likely he will be able to make a high score in a test on knowledge of rice production" (the measure of technical competency). He infers that a "rusting effect" possibly operates from being in a station and on the same job for a long time or that those who had remained for a long time in a particular station and in the same position were those who had failed to demonstrate superior ability that would merit consideration for transfer or promotion.[13]

Some farmers have ambivalent attitudes toward the extension worker, perhaps both as a result of their particular experiences which may have been unsatisfactory and their own high expectations of potential contributions from extension. The first four items in Table 3.6 show that Bukidnon rice farmers have a positive evaluation of extension's role in the improvement of their farming.

Majority of them regard frequent contacts, attending extension meetings, and consulting extension workers as important. On the other hand, their actual experiences with extension workers have not produced equally positive perceptions as reflected in Items 5 and 6. They do not seem to have much faith in the extension worker's competence as per their experience. This negative reaction is understandable, for in the process of doing the study, Chua obtained a list of farmer-cooperators from the farm management technician but when the interviews were conducted, he found that some farmers in the list had already left their farms a long time ago; others had moved to different places; and still others had already died. This simply means that the extension agent had been out of touch with the farmers in his area. Despite this state of affairs, farmers were not prejudiced against the possible contribution of extension.

Table 3.6. Bukidnon rice farmers' perceptions of extension workers.

	Agree	*Undecided*	*Disagree*
	N = 379		
		Percent	
1. Do you think frequent contacts with extension workers would help you improve farming?	76	20	4
2. Do you think attending meetings called by extension workers, C.D. workers and agricultural			

[13]Tito E. Contado, Communication Fidelity Between FMT and Rice Farmers in Leyte, Philippines. Unpublished Ph.D. Thesis, Cornell University, 1968.

Table 3.6 (Continuation)

	Agree	Undecided	Disagree
	N = 379		
	Percent		
cooperative technicians are important?	88	10	2
3. If an extension worker would give a talk or would hold a meeting, would you attend?	93	6	1
4. What would you do if your decision to use the new variety would not produce desired results?			
Accept consequences of the decision	32%		
Ask the extension worker the reason for the failure	60		
Blame the extension worker	1		
No response	2		
Landlord is responsible for it	5		
	100%		
5. Extension workers do not know any better than farmers.	29	25	46
6. Did the extension workers or other agriculture technicians provide you the knowledge and skills to improve your farm production and farm life?			
Very little	19%		
Little	43		
None at all	21		
Very much	17		
	100%		

Source: Leonardo A. Chua, Developmental Scheme for Lowland Rice Farmers of Bukidnon: A Strategy of Change. Unpublished Ph.D. Thesis, University of the Philippines, at Los Baños, College of Agriculture, 1973.

Table 3.7. Attitudes of Muslims toward improved rice production practices.

	SULU			COTABATO			LANAO			ZAMBOANGA		
	Against	Maybe	In Favor	Against	Maybe	In favor	Against	Maybe	In favor	Against	Maybe	In favor
						—Percent—						
1. To increase production new improved practices must be adopted	1	19	80	3	1	96	5	2	93	19	18	62
2. Use of new seed variety will increase production	2	20	78	2	1	97	5	0	95	16	27	57
3. Use of fertilizers and pesticides is useful and profitable	1	19	80	2	4	94	5	0	95	17	20	63
4. Advice of gov't. technicians is useful to us	1	8	91	2	4	94	5	0	95	18	16	66
				$N = 326$			$N = 507$			$N = 196$		

Source: Q. F. Miravite, A Socio-Economic Survey of Cultural Minorities in Mindanao, Sulu and Palawan Region, National Manpower and Youth Council, Mindanao State University, Jan. – April, 1971.

Even the Muslims who had minimal exposure to extension workers have favorable attitudes toward the advice of government technicians (Table 3.7). They also have a positive evaluation of new rice technology and improved production practices. However, Muslims from different provinces differ in the degree to which they hold positive attitudes toward these practices. In general, those from Cotabato and Lanao are more positive than Muslims from Sulu and Zamboanga. The latter are most skeptical and negative in their attitudes toward new agricultural practices and advice of government technicians. However, the majority of Zamboanga farmers are still in favor although less so than the three other groups. In the light of other findings about Muslim farmers, resistance to change *per se* is not likely to be the bottleneck in increasing productivity. The constraints seem to be the lack of infrastructure, facilities and services.

In an effort to determine characteristics of change agents preferred by rice farmers, Battad asked respondents from four ethnic groups in Cotabato. Table 3.8 shows two characteristics which were highly endoresed by all four ethnic groups of Muslims, Visayans, Tagalogs and Ilocanos: farm experience and residence in the town or barrio. These are both associated with the qualities of competence and frequency of contact which were regarded as ideal by Nueva Ecija farmers. Except for the Visayan farmers who expressed a greater preference for change agents older than they were, majority of the three other groups said "age does not matter." To the Muslims, having the same religion, tribe and social status was preferred. Surprisingly, the Tagalogs were more in-group oriented than even the Muslims with respect to preference for someone coming from their own "tribe" but they were less concerned about similarity of social status than the three other groups. Muslims expressed the strongest preference for change agents with the same religion. These findings point out the need for training Muslim extension workers as a link between research results and the Muslim rice farmer.

On the reverse side of the extension situation, Nayga asked 102 change agents from the Presidential Arm on Community Development, the Philippine Rural Reconstruction Movement and the Farm and Home Development Office their perceptions of farmers and farmer programs. Majority of them think that farmers most likely served by extension agencies have less than 5 hectares. Their selection of farmers to be served tends to be the interested farmers, small farmers, followed by those who have leadership status,

Table 3.8. Characteristics of change agents preferred by different ethnic groups of Cotabato farmers.

Characteristics of change agents preferred	*Muslims*	*Visayans*	*Tagalogs*	*Ilocanos*
		—Percent—		
1. *Age*				
Younger than I	1	6	5	6
Older than I	6	46	24	16
Same age	13	20	—	—
Age does not matter	80	28	71	78
2. *Residence*				
Residing in town or barrio	77	86	84	86
Not residing	3	—	—	—
Residence does not matter	20	14	16	14
3. *Religion*				
Same as mine	66	30	34	39
Different	—	—	—	1
Religion does not matter	34	70	66	60
4. *Tribe*				
Same tribe as mine	60	54	78	46
Different tribe	—	—	—	4
Tribe does not matter	40	46	22	50
5. *Farming experience*				
Many years of farm experience	94	92	100	97
No farm experience	—	—	—	—
Farm experience does not matter	6	8	—	3
6. *Social Status*				
Same as mine	90	68	35	56
Higher	—	6	3	6
Social status does not matter	10	26	62	38

Source: F.A. Battad, *op. cit.*

adequate finances, farm accessibility and educational status. These were mentioned in the order of importance as ranked by the change agents.

Obviously, they are farmers who are perceived to be more responsive to extension efforts. When asked what educational level of farmers would be most likely to adopt innovations and to attain higher income, more than 70 percent said high school or college education. On the type of farm which give higher income, 41

percent mentioned diversified farms; 22 percent, mechanized diversified farms; 12 percent, mechanized specialized farms; and 16 percent felt that none of the above farms will give higher income. Although more than 75 percent of the change agents indicated that a successful farmer can attain high and very high status, the characteristics of farms and types of farmers who they think will adopt innovations and achieve higher incomes are quite high – high school and college educated farmers operating diversified and mechanized farms. These characteristics are indeed far from being possessed by the typical rice farmer.

From the point of view of the change agents (61 percent of them), each farmer needs to be visited and assisted more than 5 times a year and that there should only be 50 farmers or less under the supervision of one change agent. With respect to techniques used in introducing innovations, lecture method was ranked first followed by demonstration, formal or informal class, a combination of the first three, face-to-face contact, visits to farms and experiment stations and mass media, last. They also believe that a team approach is more valuable than one change agent alone; that farm instruction and training is much more valuable than formalized training in schools. Their assessment as to why farmers do not adopt practices is that farmers cannot afford the capital requirements and they are convinced but do not know how to apply them.[14]

The change agents' perceptions of intensity and scope of coverage needed by the farmers is a far cry from the rather thinly spread available manpower at present. Although they believe in the value of on-farm instruction, they ranked the lecture method as first among the techniques used in introducing innovations. The high value they place on team approach comes side by side with their stated problem of "lack of coordination with other agencies," so one wonders whether they mean within agency or inter-agency team. Their perception of constraints on farmers' adoption of innovation as due to lack of capital and know-how rather than to traditionalism and resistance to change usually attributed to farmers is encouraging and doubtless has been influenced by their experiences with farmers. Furthermore, their ideal with respect to intensity of farmer coverage is very much in line with the farmers' desire for more frequent contacts with extension workers.

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[14]Rodolfo C. Nayga, Farmer Education Programs of Selected Agricultural Agencies and Socio-Economic Development, Unpublished Ph.D. Thesis, U.P. College of Agriculture, 1973.

C. Some Indications of the Direct and Indirect Impact of Agricultural Extension on Rice Farming

Although farmers themselves perceive extension workers as useful and helpful, the magnitude of their impact on rice farming is not easy to assess. An analysis by Mangahas gives us some indications of the extent to which cooperators and non-cooperators in government extension programs makes a difference in their probabilities of HYV adoption. Table 3.9 shows that cooperators, who by the nature of their participation are more exposed to extension workers than non-cooperators, have a greater probability of using HYV. This tendency was observed both on rainfed and irrigated farms.

Table 3.9. Standardized probabilities of HYV use in Central Luzon, by availability of irrigation and participation in government program, crop year 1968-69.

Participation in Government Program	*Rainfed*	*Irrigated Wet Season*	*Irrigated Dry Season*
Non-cooperators	0.074	0.198	0.232
Cooperators	0.264	0.253	0.402

Percent of Farmers Adopting HYV's Classified by Irrigation and Participation in Extension Program

	1967	*1968*	*1969 (Planned)*
Rainfed Lowland			
Cooperator	13.0	24.6	37.7
Others	3.8	7.0	32.9
Total	5.3	10.0	33.7
Irrigated Wet			
Cooperator	14.7	33.5	71.1
Others	7.6	17.8	6.19
Total	11.0	25.3	66.3
Irrigated Dry	26.2	47.1	68.4

Source: Mahar Mangahas, A Cross-Sectional Study of the Diffusion of New Rice Varieties in Central Luzon. Unpublished Ph.D. Thesis, University of Chicago, 1970.

Contado's study of Leyte farmers showed statistically significant differences in the mean rice yields of farmers who are active, casual, and non-participants in farmers' clubs. The mean yields are 68.1 cavans per hectare, 46.9 and 40.7, respectively, for the three groups.

These findings, however, point out the selectivity factor in participation as shown by the fact that active participants have higher self-reported social status, economic status, exposure to printed media, radio, visits to agricultural schools and experiment stations and number of visits to rice demonstrations.[15] Furthermore, Contado also found that active participation of farmers in farmers' clubs is significantly related to effective communication between the farm management technician and rice farmers. Participation is important to the farmer because it increases his exposure to different sources of information, awareness of new information and practices, confidence in new practices and in oneself, initiative and adoption rate and productivity.[16]

The Battad and Derongongan studies in Cotabato and Lanao del Sur cited earlier showed very clearly the impact of contact with extension workers on adoption of recommended rice production practices. The lag in adoption of innovations among Maranao farmers, 32 percent of whom never had contact with extension workers, is quite pronounced. Although 67 percent were aware of HYV seeds, only 22 percent used them; 82 percent were aware of fertilizers but only 35 percent used them; 69 percent were aware of insecticides but only 7 percent used them. The reasons for non-use are quite revealing, for the most frequently mentioned ones are unavailability of seeds, fertilizer and insecticides in the locality, lack of knowledge on how and what fertilizer and insecticides to use, and lack of capital to purchase the inputs.[17] The relationship between lack of contact with rice expertise and lack of knowledge can be inferred from these reasons. The very few Maranao farmers who were exposed to extension personnel of different agencies unequivocably pointed out that those workers had taught them modern ways of farming and, therefore, helped most in increasing their yield. Their concern for the matter of expertise in rice production is revealed in their response to a question on whether or not they consulted with local Muslim leaders regarding rice production. Seventy percent said "No"; 13 percent said "Yes" and 17 percent had no reply. Of interest here are the reasons given by those who said "No." Thirty-one percent said their leaders did not have the competence; 48

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[15] Tito E. Contado, "Factors Associated with the Active Participation of Rice Farmers in the Local Farmers' Club," *Community Development Digest*, No. 2, July-Dec. 1969, pp. 25-36.

[16] Tito E. Contado. Unpublished Ph.D. Thesis, *op. cit.*

[17] M. B. Derongongan, *op. cit.*

percent said they could do it alone; and 21 percent indicated that the local leaders were not needed in making decisions on their farms. All these are signs of the value which Muslim farmers place on competence as a basis for consulting anyone on rice production. Traditional positions of leadership in the community are not associated with such expertise.

Although other studies also show significant positive relationships between contact with extension workers and adoption of recommended rice practices,[18] another way of showing the role of the extension worker is through an appreciation of his absence. The Bicol farmers, for example, who entered into a management contract with the Bicol Development Company during the early years of the new rice technology, found yield differences before, during and after the termination of the contract. The average yields per hectare were 70 cavans, 136 and 98, respectively. The decline in their rice yields after the contract was attributed by the farmers to the absence of the technicians and lack of production inputs. Since they were not sure of technical supervision, they hesitated to make investments. Among those who expressed satisfaction with the management services of BIDECO, availability of technical advice was one important reason cited. As a matter of fact, anticipation of such advice was an inducement to enter into the management contract.[19] Similar findings were reported by Victorio in his study of compact farms where the farm management technicians were part of the rice production credit program. When farmers were asked later why they were not satisfied with their production, ignorance about new technology because of the fact that the expected technician did not visit them, was prominently mentioned. They claimed that they were given inadequate and unsustained technical advisory assistance.[20]

All of these findings on how much the extension worker is missed if he is not available point out his positive contribution to the reduction of risk on the part of the farmer, especially if he is borrowing money to purchase inputs for his farm. Despite all these

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[18]Farm and Home Development Office, U.P. College of Agriculture, Rural Change in a Philippine Setting, *op. cit.;* G. T. Castillo, *et al.,* The Green Revolution at the Village Level, *op. cit.;* in R. T. Shand (ed.), *op. cit.;* and S. L. Pahud, *op. cit.*

[19]Wilfredo G. Olaño, Farmers' Responses to the Rice Production Program of the BIDECO in Selected Municipalities of Three Bicol Provinces. Unpublished M.S. Thesis, U.P. College of Agriculture, 1971.

[20]Rodrigo P. Victorio, A Study on the Selda System. M.A.T. Thesis, (Economics), Notre Dame University, July 1971.

indications of the extension worker's role, a 5-year study showed that 80 percent of the contacts with farmers were initiated by the extension worker.[21] As revealed in the Bureau of Agricultural Economics figures in this chapter, only a small percentage of farmers visited the extension workers' office and their reasons for not doing so were "not necessary" and "too busy with farm work." The farmers' heavy reliance on extension-worker-initiated contact which co-exists with research findings showing the important role which farmers attribute to extension workers, is difficult to explain. Perhaps they acknowledge his positive contribution but do not consider him indispensable and, therefore, are not prepared to make an effort to go to the extension worker. They wait for him to come to them. But this is also part of the development process.

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[21] Farm and Home Development Office, *op. cit.*

4
The Changing Filipino Rice Farmer

One of the most promising developments in the past five years of Philippine agriculture is the realization that the rice farmer is not the unchanging creature that he has been stereotyped to be. When presented with viable alternatives for modifying his life and his ways, he has proven to be as responsive as any other modernizing man. With the adoption of new rice technology came a modernizing outlook in agriculture, new attitudes, aspirations, perceptions and amenities in life. This chapter describes the nature of these changes as told in several empirical studies, some of which have made observations over time. In the midst of all the controversy arising from the theorized, expected, anticipated, and actual consequences of the green revolution, the rice farmer who is the central figure and the original object of all efforts to increase productivity, seems to have been neglected. The pre-occupation with structural changes such as income distribution, growth rate, and employment dislocations has obscured the changes at the individual farmer level. As a matter of fact, some macro-economists are skeptical about the value of micro-level studies which focus on the village and the individual. It is hoped that this chapter will rediscover the central figure and give him the importance he deserves. After all, we do claim wittingly or unwittingly to be concerned about his welfare.

A. The Anthropologist's View

Because of the intensity with which anthropologists pursue their social and cultural studies and their wont to be protective of "pristine" societies, their insights may be particularly valuable. Lewis, for example, in his study of Mambabanga, Isabela, found that from 1963 to 1970 when he returned to the place, the most significant change, in his judgment, did not come directly from the introduction of new rice varieties but from the extension of the Magat Irrigation System. Crops of rice were grown where there was a

single crop before. Grain production increased three times. Irrigation societies were still functioning with less internal friction and a greater premium was placed on irrigated land. There were new schools, a new chapel, improved roads, transistor radios and hand tractors. Whatever the actual degree of difference, Lewis concluded that the people were much better off. In Buyon, Ilocos Norte, three crops were grown, one of garlic and two of rice. This was made possible by the short-maturing HYV's. A great deal of experimentation was being done by the individual farmers and they themselves talked about this experiment, the reports of new varieties, improved tastes, shorter growing periods, greater disease resistance, better marketing, requirements for weeding, cost and uses of pesticides, fertilizers, and changing cropping patterns. Lewis believes that the system of agriculture changed when Ilocano rice farmers decided to grow miracle rice. He pointed out that in doing so, farmers changed from a long-established pattern of farming to one where the risks are relatively greater. From his point of view, the real miracle that has happened in Ilocos Norte is the individual adaptations and decision-making which farmers had to do in the new system of farming. However, he thinks that the significant changes in the environment are changes which involve "harsh punishment as well as rewards." He notes that the two or four HYV's which were replacing the 10 to 20 different varieties grown before could lead to substantial losses and the specter of starvation.[1] It is something like putting all the eggs in one basket. With more varieties being grown in the past, the risks were distributed. In the new system, the farmers are taking greater risks in their desire for greater returns.

Takahashi, another anthropologist who studied a rice village in Central Luzon in 1963-64, was impressed by his observation that "peasants did not have any will at all to increase the level of productivity of the land they cultivate. It is too much to expect peasants to have a positive desire for increased productivity, yet it is puzzling to see them doing nothing when it is quite obvious that a little more care and effort could prevent reduced crops." He cited instances when plants remained flooded for a week right after transplanting because the cultivator made no outlet in the dike. When ordinary rain continued to fall for one or two days, yields were reduced due to overflowing of water over reaped palay which

[1]Henry T. Lewis, Ilocano Rice Farmers: A Comparative Study of Two Philippine Barrios. University of Hawaii Press, Honolulu, 1971, pp. 183-187.

was spread out for drying. Reaped palay was piled into stacks which resulted in shattering of grains instead of spreading it out on canvasses or mats on the ground. Seed selection was not practiced when simple salt water method would have given them better seedlings. This apparent lack of willingness to increase productivity, he attributed to the land tenure system by which increased output from improved productivity is taken away by landlords. "Since landlords do not meddle with peasants' incomes from work other than tenant farming, peasants make efforts to increase their incomes by concentrating their own and their families' labor on self-employed small business and wage work rather than increase farm productivity through such means as intensifying labor in their land and better fertilizing. Thus peasants' input of labor in their land stands at the minimum level, sometimes below the level." As he describes it, the share tenancy system is for landlords to pay land taxes and half of farming expenses, advance money to tenants for the payment of farming expenses and collect both farm rents and advanced money at harvest time. Landlords rarely showed positive interest in the management of their farms and only a few attempted to increase farm productivity through long-term capital investment in land improvement. And although tenants were called share tenants they were more like agricultural wage workers who share little responsibility or risks for farm management. For them farming does not mean the creation of profits from agricultural production but is the basis of the landlord's guarantee for their livelihood. In a footnote, Takahashi mentioned reports regarding the intensified extension of service being carried out in 1967 regarding adoption of new varieties IR-8, BPI-76 and of improved practices such as straight-row planting, adequate fertilization, water management, etc. and the high yields per hectare being realized. Despite this information, he remained skeptical and pessimistic: "It is certain that this governmental extension work has been done in an effective manner, but the actual response of the tenants and landlords remain unknown. Since we have seen that the Masagana (modern rice cultural practices introduced earlier) had once been tried and then abandoned under the present agrarian relationship . . . It will be shown in the future whether this change is rooted firmly or not. Of course, the result will depend, at least in part, on the effectiveness of implementing agrarian reforms."[2]

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[2]Akira Takahashi, Land and Peasants in Central Luzon: Socio-Economic Structure of a Philippine Village. East-West Center Press, Honolulu, 1970.

In a revisit of the same village in 1971, the author recognized substantial changes in agriculture and in the life of the villagers. These he attributed to such significant elements as (a) the shift from share-tenancy to leasehold which started around 1968 even before the area was proclaimed land reform district in 1969; (b) the introduction of new rice varieties since 1966; (c) intensive extension work by 19 experts from Taiwan and 41 Filipinos from 1966 to 1967; (d) improvement of irrigation facilities by the National Irrigation Administration and the Asian Development Bank between 1967 and 1970; and (e) activation of the Farmers' Cooperative Marketing Association under the land reform program. The impact on agricultural production is evidenced by the fact that 75 percent of the cultivators are under leasehold paying a fixed rental of 20 cavans, in some cases 15 cavans per year, per hectare, while the average yield of paddy field is more than 200 cavans a year. This represents a two and a half times increase over the 1964 yields. New varieties, straight-row planting, weeding, application of fertilizer and insecticide, construction of improved ditches, and effective utilization of backyards are in evidence. Rotary weeders and sprayers are owned by as many cultivators just as use of the tractor and the thresher has become more common. Improvement in irrigation has resulted in the increase of double-cropping from 60 to 85 percent of the total paddy field. All cultivators sell part and eat part of their produce. Some heads of farm households, who are also part-time rig drivers, barbers or harvesters, have given up these side jobs to devote themselves more intensively to farming operations. Women who used to weave hats have given that up too because of lower returns.

The level of living has likewise improved as observed in new houses, renovating of old ones using more durable materials, increase in the number of college students, household equipment and even fighting cocks. With motorized pedicabs and motorbikes which have replaced horse-driven rigs, the town proper has become more accessible to the barrio. All told, there is an increase of money circulating in the area.

Among the other changes are: (a) shift of credit sources from landlords to institutional sources like the rural bank and the farmers' cooperative; (b) greater attention given by cultivators to their farms such that they watch the field, regulate water level, and take steps to minimize production losses; (c) decline in the use of hired labor and more intensified use of family labor; (d) growing contractual

relations between cultivators and hired labor, including closer supervision of the latter's work; (e) communal customs such as gleaning and allowing harvesters to take home sheaves of palay are diminishing; and (f) improved farm management by way of minimizing farm expenses and maximizing returns and heavy dependence on family labor.[3]

Takahashi labels all these changes as the peasantization of share tenants who in the past behaved more like rural proletariat or farm laborers who had no interest in increasing productivity. However, he sees this changing agricultural structure and the accompanying peasantization in the disintegration of the village community which lends itself to peasant organizations. He also perceives the likely polarization of cultivators into those who respond positively to institutional stimulations and those who remain timid. This, he predicts, will lead to accelerated disorganization of the village community.

From the descriptive accounts of the two anthropologists, Lewis and Takahashi, emerge two general observations: (1) the willingness of farmers to assume greater risks in the expectation of greater returns is accompanied by an "experimental" outlook in trying to find better ways of doing things on the farm; and (2) a changing work ethic with respect to farm productivity and a growing contractual relationship as a result of a more business-like approach to rice farming. Both Lewis and Takahashi, however, have misgivings about these developments. The first one thinks farmers are putting all their eggs in too few baskets by planting only one, two or three HYV's instead of the usual multiple varieties. The second one worries about the social dislocations which accompany the changes taking place. For a long, long time everyone was concerned about the persistence of traditional ways in rice farming, the low level of productivity and the accompanying poverty. Now that these farmers have exhibited signs and symptoms of change, we seem to be afraid about the risks they are willing to take and the changes in social relationships which are emerging in the process. The misgiving which relates to the fact that some will respond more quickly than others seems to imply that since they could not all respond equally, it might have been better if these changes have not come about at all. This

[3]Akira Takahashi, Peasantization of Kasama Tenants: Socio-Economic Changes in a Central Luzon Village. Seminar Paper presented at the International Rice Research Institute, Aug. 19, 1971.

also implies that the traditional community was an ideal community where people were equally poor, self-sufficient and social harmony reigned. The fact that the farmers responded with enthusiasm to the new ways and to the institutional stimulations is an indication of what they might have been looking for. To fear disorganization and risk is to deny them the capacity to live with these things. However, to anticipate direct and indirect social consequences with a view to scrutinizing policy alternatives is an imperative which cannot be escaped. The choice is no longer between *change* and *non-change* but rather between alternative strategies to change. The problem is no longer focused on factors associated with acceptance or rejection of innovations. It has shifted to the consequences of acceptance under different environmental and institutional settings.

Directly relevant to this matter is Mercado's observation which represents a reversal of the commonly accepted notion that "a barrio cannot develop when the population is not ready for it; in other words, when its population does not have the basic attitudes required for development."[4] The underlying assumption is that unless attitudes change behavior will not change. Mercado's findings demonstrate otherwise in his study of 180 farmers in 44 barrios in Albay, in the Bicol region. He compared two groups of farmers, the "persuaded" and the "compelled" with respect to their attitudes toward and adoption of new IR varieties. The first group had positive attitudes toward the new seeds brought about by a persuasion strategy composed of farm and home visits, demonstrations, meetings, seminars, field trips, and mass media messages. For the second group, the strategy applied included the policy of agricultural credit agencies giving loans only to farmers who agreed to plant IR-8 and other HYV's. The other techniques employed by some landlords were giving seeds to tenants who did not like to plant IR-8, threatening some tenants with ejection if they would not plant IR-8, promising to handle the initial expenses for planting, fertilizing and weeding if the tenants planted IR-8 and promising to pay for the number of cavans that would fall short of the expected harvest. In many ways, however, these measures subsidized risks for the farmer. Initially the "persuaded" and the "compelled" groups did not differ in the proportion planting IR-8 and other IR varieties except that the latter had negative attitudes toward it. They also adopted more

[4]Cesar M. Mercado, Communication Strategies and Their Impact on Launching the 1967 Green Revolution in the Philippines, *Philippine Journal of Communication Studies,* Vol. I, No. 1, September 1971, pp. 25-43.

cultural practices than the "persuaded" group. After the first planting, 71 percent of the "compelled group" changed from negative to positive attitude toward the new seeds, while 6 percent of the "persuaded" group changed from positive to negative. There was a direct relationship between yield increase and positive attitude toward the new varieties. Among those who achieved 1 to 20 cavans yield increase, 88 percent had positive attitudes, but among those who gained 20 cavans, 97 percent had favorable attitudes.

Table 4.1. Relationship between strategies and attitudes of farmers toward IR-8 before and after planting it.

	Before		*After*	
	Persuasion	*Compulsion*	*Persuasion*	*Compulsion*
	Percent		*Percent*	
Positive Attitude	100		93	70
Neutral			5	5
Negative		100	2	25
			100	100
	N = 90		N = 90	

Relationship Between Yield and Attitude of Farmers Toward IR-8

	Increased yield	*Same yield*	*Decrease*
		– Percent –	
Positive	92	50	67
Neutral	3	25	9
Negative	5	25	24
Total	100	100	100

Relationship Between Amount of Yield Increase and Attitude Toward IR-8

	Yield per hectare increase		
	1-10 cavans	*11-20 cavans*	*Over 20 cavans*
Positive	88	88	96
Neutral	4	5	2
Negative	8	7	2
Total	100	100	100

Source: C. M. Mercado, *op. cit.*

These findings suggest that attitudinal change follows behavioral change. Compliance has led to rewarding results and a corresponding positive attitude toward what was originally "compelled" behavior. Obviously, favorable attitudes come with the positive results of the "compelled" change in behavior. If compulsion led to negative results, one can hardly expect the shift to positive attitudes.

B. **Aspirations, Expectations and Perceptions**

In 1963, data gathered from 692 farmers in eight villages in Laguna showed that improved farming methods were not perceived as the avenue to increased income. Twenty-seven percent of the farmer-respondents said that to raise their incomes they would work harder. An equal number said they would look for other jobs. Only 1 percent indicated they would consult technicians about new methods of farming. Nine percent admitted not knowing what to do. In the same villages, farmers were also asked for a general evaluation of their rice yield. Fourteen percent said their yield was *good* (32 cavans per hectare); 33 percent said their yield was acceptable (31 cavans per hectare); 63 percent said it was low (22 cavans per hectare); 4 percent had no yield evaluation (15 cavans per hectare). From these figures, it is apparent that the yield evaluations of the respondents were realistic. This realism is further borne out by their explanations for low yields. In the order of frequency they were: attack by pests and diseases, unfavorable weather conditions, soil either very fertile or very poor, improper care and time of planting, too many weeds, poor seeds, low tillering capacity, lodging and empty grains. It is evident from these responses that farmers perceived a direct relationship between yield and actual procedures involved in rice growing.

Three years later, after the change of cropping pattern, the experience of better yields, and greater faith in technical assistance from crop specialists, farmers were asked if it were still possible to increase yield beyond the volume obtained in the three immediately preceding seasons. Ninety percent said *yes,* 8 percent said *no more,* and 2 percent were uncertain. In the first category, farmers were asked by what means they planned to increase yields. Their responses included weeding, fertilizer application, spraying against pests and diseases, irrigation and planting good seeds. At that time their average yield was about 50 cavans, almost 20 cavans more than that in 1963. In early 1969, a conversation with some farmers in one of

the villages elicited the following statement: "In 1963, our highest yield was 40 cavans, but now unless one has four harvests of at least 100 each, a farmer still has a lot to learn. He had better go back to school (the barrio rice school)."

Besides this heightened ceiling of their yield aspirations, farmers have changed their definition of what constitutes as "ridiculous" farming practice. In 1964, straight-row planting was laughed at. It was regarded as a waste of money. Today in this area, the farmer who does not plant in straight rows is the butt of jokes. The same form of ridicule was applied to farmer hold-outs who continued with the traditional variety after the majority had discontinued it. These villages have now been converted 100 percent to the new varieties.[5]

Change-orientation is related not only to the social pressure to conform to the new behavioral pattern but also to the demonstration effect in the sense that modern practices have actually contributed to a higher level of achievement in rice production. Another study which was done prior to the introduction of HYV's found very high positive correlations between a farmer's aspired-for yield and actual yields obtained in the village. These findings suggest that recognition of what is possible and knowledge of actual achievement influence yield aspirations and expectations.[6] In other words, the actual yield performance of the farmer himself as well as of the village becomes a reference point for the expectation. Therefore, where high yields have been experienced either by a few or by many farmers, the ceilings for yield expectations would be high.

This enthusiasm among farmers for high yields is manifested again in Groot's findings. When rice scientists, extension workers and farmers were asked about their predicted average yields 5 years from the time of interview in 1969, the farmers gave the highest prediction of 153 cavans per hectare; extension workers gave an average of 120 cavans, while the scientists predicted only 67 cavans average. Farmers also perceived the least number of varietal characteristics as being relevant to varietal selection. They mentioned an average of three characteristics; extension workers mentioned more than seven, and

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[5]Gelia T. Castillo, Impact of Agricultural Innovation on Patterns of Rural Life (Focus on the Philippines), *Agricultural Revolution in Southeast Asia: Consequences for Development,* Vol. II. Report of the Second SEADAG International Conference on Development in Southeast Asia, New York, June 24-26, 1969, The Asia Society, 1970.

[6]Tej P. Singh and G. T. Castillo, The Effect of Aspirational Level on Adoption of Recommended Practices in Rice Cultivation, *Allahabad Farmer,* Vol. 52, No. 5, Sept. 1968, pp. 238-295.

scientists gave more than nine.[7] Knowing so much more about the limitations to their research results, scientists tended to be much less optimistic about yield potentials. There were so many more aspects (both positive and negative) which they took into account. On the other hand, farmers tended to get carried away by positive characteristics unless proven otherwise.

The phenomenon popularly known as the "revolution of rising expectations" finds reinforcement in Wickham's study which shows that adopters of recommended rice production practices had low propensity to pay for irrigation fees. High adoption which represents high aspirations and expectations was associated with a less favorable evaluation of irrigation services. Since many of the recommended production practices were dependent on water for their implementation, high adopters tended to expect better services in order to achieve their aspirations. In the areas which experienced drought, there was less satisfaction with yield and water adequacy but a greater propensity to pay irrigation fees because water shortage made them realize the value of water more and were, therefore, more willing to pay for it. On the other hand, where water was more available, and adoption was higher, the aspirations and expectations regarding irrigation services were much higher and consequently their dissatisfaction with existing services was greater. Since these expectations were difficult to meet, these high adopters with high aspirations were less willing to pay for what they considered *poor* irrigation services.[8]

The concept of relative deprivation was also manifested in the Laguna farmer-and non-farmer respondents who were asked to evaluate the sufficiency or insufficiency of family income relative to their needs. Fifty-four percent claimed their income was *sufficient* and 46 percent said *insufficient*. What is interesting is that people living in villages relatively far away from commercial centers were more satisfied with their income than those living in villages close to the commercial centers. Furthermore, villages with the highest percentages of people claiming sufficient incomes were those whose mean computed household incomes were significantly lower than the mean or were just around the mean. The villages with lower proportions of people reporting sufficient incomes were those whose

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[7]H. C. Groot, *op. cit.*

[8]Gekee Wickham, Sociological Aspects of Irrigation. Unpublished M.S. Thesis, University of the Philippines, College of Agriculture, 1970.

actual incomes were significantly higher than the mean. This means that those objectively better-off were the ones inclined to assess their incomes as sufficient and vice-versa. However, there were two out of 50 villages whose subjective evaluations corresponded closely to objective income levels. This indicates that people in those villages with low incomes had higher proportions reporting insufficient incomes.[9]

The relativity of satisfaction with their own livelihood and community, depending upon the frame reference, is expressed again by the Bukidnon lowland rice farmers who think that most people in their community are in about the same condition as they are but that people living in Cagayan de Oro (the nearest urban center) have a better life and are happier. They have a low level of satisfaction with their community as indicated by high endorsements of statements like "Not much can be said in favor of a place like this" and "This place will never seem like home to me." More than 70 percent also prefer to transfer to another settlement if the government would give them a piece of land. Realizing, however, the futility of this dream, they are unwilling to accept that the future of their community is not bright and if they were to start all over again, they would not farm in another place. They also disagree that people living outside their community are better off than farmers in the area. In other words, if there were other opportunities, these would seem better but considering what they have, the future could be bright although life in the urban center appears to be the better and happier one. Undoubtedly, satisfaction with the community is closely related to the people's major occupation. It is significant that 53 percent of these farmers did not initially choose farming as an occupation. They are in it because there is no other job available, there is no opportunity for them to continue college studies, this is the experience they had, their parents and relatives are farmers and the feeling that this is the only job they are suited for. About 43 percent are in rice farming for positive reasons such as 25 percent of them categorically saying "I like it, it is my ambition." Eleven percent admit there is money in it and 7 percent think they can be of service to society. The rest (4 percent) were encouraged to farm by their parents. In summary, there are more negative than positive reasons for being in rice farming and for staying in their community, despite

[9]Paul Meijs, An Evaluation Research of the Philippine Rural Reconstruction Movement's Barrio Development Program in Laguna: A Baseline Study. Asian Social Institute, Manila, January 1973.

the fact that about 60 percent of them own the land they farm.

Accompanying this lack of more positive feelings about rice farming are certain realities like lack of water as their most pressing problem. Although 70 percent of the farmers used the HYV seeds, their average yields for 1970-71 were 42 and 22 cavans, respectively, for the first and second crop. For 1971-72, the figures were 35 and 28 cavans per hectare. They had also been plagued by pests and diseases. Their most important aspirations for farm improvement in their rank order are: to increase rice production per hectare, expand size of farm business, get labor-saving equipment for the farm and to achieve higher farm profits. Practically all of them (95 percent) expressed willingness to participate in future training programs. The training needs they identified were farm management, crop production, home improvement and leadership, in that order. Farm management areas desired were: planning and programming of farm activities, management of different farm production projects, production and marketing, use of credit facilities, record-keeping, farm accounting and budgeting. In crop production, training, identification and control of pests and diseases and water management were most desired. Diet and nutrition was the priority in home improvement and agricultural cooperative training was first in the area of leadership. Aspirations for home improvement centered on wanting to have new and attractive houses, home furnishings, artesian well, and fencing around the house. One cannot begrudge farmers these dreams, considering that most of them live in cogon-roofed houses which are gradually shifting to galvanized iron roofs and strong lumber.[10]

In contrast to Bukidnon farmers, there are indications of changing attitudes toward farming in other places. An analysis of 1963-69 data from Laguna villages[11] mentioned earlier shows an improved evaluation of rice farming as an occupation. In 1963, the question posed to the farmer-respondents was: "If you were to leave your present occupation, what would be the most important basis for the decision you would make? " Sixty percent said prospects for higher income and 15 percent mentioned an easier job (Table 4.2). Because their major occupation was farming, this response had reference to what basis they might have for moving out of farming

[10]L. A. Chua, *op. cit.*

[11]Gelia T. Castillo, *et al.*, The Green Revolution at the Village Level: Philippine Case Study (1963-1970). Paper presented at the International Congress for Orientalists held at the Australian National University, Canberra, Jan. 6-12, 1971.

(mainly rice farming). The most significant change in 1969 was that 45 percent of the same respondents felt they would not consider leaving their occupation and only 36 percent would think of making that decision for reason of higher income. This could be interpreted as greater satisfaction with farming as a good source of livelihood in 1969 than in 1963.

Table 4.2. Important basis for deciding to leave present occupation.

Basis for decision	*1963*	*1969*
	Percent	
1. Higher income	63	36
2. Easier job	15	8
3. Prestige and satisfaction from job	7	—
4. Not leaving present occupation	7	45
5. Don't know	8	9
6. Availability of capital	—	2
Total	100	100

Source: G. T. Castillo, *et al., op. cit.*

Even to the hypothetical question asked of them six years before, only 7 percent replied that they would not consider moving out of the occupation they had at the time. Further support for this interpretation is provided by the fact that 64 percent of those who said their income increased from 1963 attributed it to increased yields. Another significant finding indicated in Table 4.2 is the value farmers place on high income as a criterion for choosing an occupation. Prestige and satisfaction derived from the job was mentioned only by 7 percent in 1963 and by nobody in 1969. Economic returns, therefore, rather than psychic returns appear to be the stronger attracting power.

Over a 6-year period, the respondents' views on how to improve farming have shown remarkable changes toward a recognition of the role of modern inputs such as chemicals, fertilizer, weeding, straight-row planting, new varieties and the hand tractor. This type of response increased from 10 percent in 1963 to 65 percent in 1969, with the first three inputs being most appreciated (Table 4.3). To those concerned with the impact of the new high-yielding

varieties, it might be a disappointment that only 4 percent of the responses had reference to new varieties. This could readily be explained by the fact that the use of HYV's was already taken for granted because practically all of them had adopted one or a combination of these new varieties. As a matter of fact, more than 80 percent of the farmers had adopted these new seeds as early as 1967. It was the most highly accepted and readily applied innovation. Related to this observation is the response on consulting knowledgeable persons such as agriculturists. There was a decline of such response from 25 to 9 percent. Again, is it a diminished recognition of the role of technical personnel? This does not seem to be the case because data from Tables 4.3 and 4.4 show otherwise. The use of technically trained personnel is again assumed because they are already the major source of information on modern farming. Furthermore, 14 percent in 1963 mentioned being the first to adopt new practices as a way to improve farming. In 1969, no one gave this response.

Again, it would seem that new farming methods have made headway and, therefore, being the "first" to adopt them was no longer the critical factor in 1969. The farmers have moved to another level in their farming and so has the reference point. It is no longer a question of what ways could improve farming but rather what means could further improve what they already had in 1969. For example, reliance on own experience and knowledge had faded out and so had "following the advice of the Barrio Captain", and the conviction that "it is hard to change farming methods" but the need to experiment on new farming methods gained ground. This concept of "experimenting" is quite different from being the "first to adopt" because in the former, the farmer is trying new methods on his farm in an effort to choose from alternative ways of doing things. This is perhaps traceable to the idea of using different combinations of inputs on the farmer's field, which was very much part of the technicians' modus operandi in the villages. Noticeable also is the drop from 26 to 10 percent of the response indicating that they do not know how to change farming methods.

For further evidences of a modernizing outlook in farming, Table 4.4 shows the increase from 47 to 63 percent of respondents mentioning technicians from different government agencies as their sources of information for modern farming. There was a decline from 15 to 2 percent of those who relied on personal experiences and

Table 4.3. Views on ways to improve farming.

Ways to improve farming	*1963*		*1969*	
	N	*Percent*	*N*	*Percent*
1. Use of				
a. Chemicals (insecticide, pesticides)	4	1	99	18
b. Fertilizer	13	4	137	24
c. Weeding, clean culture, straight-row planting	10	3	86	15
d. New high-yielding varieties	3	1	21	4
e. Tractor	5	1	22	4
2. Irrigation water	9	2	32	6
3. Capital	2	1	10	2
4. Higher price for palay	1	–	2	–
5. Wait and see others' experiences before trying new farm practices	20	5	2	–
6. Consult knowledgeable persons such as agriculturists and other government workers	92	25	49	9
7. Follow the advice of barrio captain	17	5	–	–
8. Be the first to adopt new practices	52	14	–	–
9. Experiment on new farming methods	15	4	37	7
10. Rely on own experience and knowledge	20	5	–	–
11. Shift to leasehold, ownership or increase size of area being cultivated	3	1	6	1
12. Unite and organize farmers	4	1	1	–
13. It is hard to change farming methods	2	1	–	–
14. Don't know how	93	26	59	10
Total number of responses	365	100	563	100

Source: G. T. Castillo, *et al., op. cit.*

trials. The use of other farmers increased because of farmer-leaders who were given training. Mass media such as radio, newspapers and magazines had not been very significant as sources of farming information. The roles of parents, relatives, landlords and barrio officials were also minimal in this respect. In the case of home management, the trend was the same except for the increase in the

Table 4.4. Sources of information for modern farming and home management.

Source of information	Farming		Home Management	
	1963	1969	1963	1969
	— Percent —			
1. Technicians from different government agencies	47	63	28	42
2. Reliance on personal experience and trials	15	2	32	16
3. Other farmers	10	13	–	–
4. Mass media (radio, newspapers, etc.)	1	1	1	1
5. Parents and relatives	2	1	15	1
6. Barrio council officials	7	3	–	–
7. Others (landlord, rural bank, etc.)	2	2	1	–
8. Don't know	16	15	17	36
9. Neighbors and other persons we can imitate	–	–	6	4
Total	100	100	100	100

Source: G. T. Castillo, *et al., op. cit.*

proportion of respondents saying, "Don't know where to obtain information on modern home management." This is interesting because the role of personal experience, parents and relatives had declined but much greater use of home management technicians remained to be realized. Only 42 percent of the respondents in 1969 mentioned them as source of information for modern home management. This discrepancy between the use of technicians for farming and for homemaking information is understandable, since there was a greater focus on farming and even home management technicians worked more on this aspect than on their own field of specialization.

Since farming before 1963 was largely traditional and new agricultural practices were introduced mainly from the outside, being an innovator among these farmers has its status meanings. In 1963, the respondents were asked to name persons whom they considered as innovators in farming. Table 4.5 shows that in 1963, possession of

farm implements was regarded as an important criterion mentioned by 45 percent of the respondents. Thirty percent mentioned the use of modern farm practices, new seeds and achievement of high yields. In 1969, technical training acquired from the College of Agriculture or from the agriculturists they had contact with, gained prominence as a reason for considering a person as an innovator. The increase was from 13 to 47 percent. The use of modern farm practices ceased to be a distinguishing characteristic of the farmer innovator, since the majority of them by 1969 were already using one or more of such new practices. The importance given to possession of farming implements in 1963 is due to the fact that the majority of the farmers then owned only the barest essential equipment for farming. The implication is that those who had the implements had a better chance of adopting farming innovations. By 1969, hand tractors, sprayers and planting boards were no longer rarities in the barrio.

Another significant development is the increased recognition of capital (from 2 to 12 percent) as a factor in enabling farmers to adopt innovations. This is, of course, related to the fact that

Table 4.5 Reasons for naming certain persons as innovators in farming.

Reason for naming innovator	*1963*	*1969*
	Percent	
1. Uses modern farm practices, new rice varieties and has high yield	30	12
2. Had technical training from college of agriculture technicians and specialists, hence they also teach other farmers	13	47
3. Has farming implements	45	6
4. Has sufficient capital	2	12
5. Is industrious, cooperative, and has good public relations	3	5
6. Has a big farm	1	3
7. Owns the land he cultivates	1	1
8. Has good irrigation water	–	2
9. Is the head of the barrio	1	2
10. First to farm here	3	2
11. Almost everybody started using the new practices at the same time	1	8
Total	100	100

Source: G. T. Castillo, *et al., op. cit.*

practically all of the new farming methods such as use of fertilizer, chemicals and weeding require some capital outlay. In other words, the responses were more in the nature of what enabled them to innovate. Judging from the 1969 trends, having technical training provides the opportunity to keep up with new knowledge and combined with sufficient capital with which to put this into effect, the conditions for innovation seem to be favorable.

Another interesting observation is that 8 percent of the respondents in 1969 did not mention any farmer innovators because almost everybody started using the new practices at the same time, so being "first" was no longer anybody's monopoly. There is some merit in this observation because of the change in cropping pattern which required several adjacent farms to adopt new seeds and new inputs to go with them. In this sense, several farmers adopted the new practices at the same time.

When asked what basis they had for saying that a farmer was progressive, about one-half of the respondents in 1963 and more than two-thirds in 1969 mentioned "good harvest and good income from farming" which enabled them to buy what their families needed and to have some savings and capital. Thrift and hardwork was cited by only 7 percent of the respondents (Table 4.6). It is particularly enlightening that adoption of modern practices does not by itself constitute a hallmark of a progressive farmer as indicated by the low proportion of respondents (6 percent in 1963 and 10 percent in 1969) giving this answer. This means that the more important focus is on the harvest and the income resulting therefrom and not mere adoption of modern farm practices, which is at times non-rational and uneconomic.

But more worthy of expanded discussion is the dramatic decline in emphasis on "absence of debts" as a characteristic of a progressive farmer (from 26 to 6 percent in 1969). This is a substantial change in the outlook of people who had traditionally regarded borrowing money as something to be avoided. Farm expenses then were regarded as expenditures and not as investments from which pay-offs could be expected. The intent was to minimize expenses, thus minimizing risks. Apparently, the concept of credit as productive investment has become more acceptable. In 1963, borrowing was resorted to only under critical circumstances and loans were used mainly for subsistence and consumption items. Pahud's 1967 study shows that 77 percent of the 179 farmers surveyed had debts either in cash

Table 4.6. Basis for saying that a farmer is progressive.

Basis for opinion	*1963*	*1969*
	Percent	
1. Absence of debts	26	6
2. Good harvest and good income from farming (sufficient to buy land, household items, send children to school and has savings and capital)	48	67
3. Being thrifty and hardworking	7	7
4. Adoption of modern farming practices	6	10
5. Don't know	5	5
6. Have not seen anybody progress in farming	1	–
7. Respected by other farmers	1	–
8. Cultivation of a large area, ownership of land, or being a lessee	3	4
9. Blessed with good luck	3	1
Total	100	100

Source: G. T. Castillo, *et al., op. cit.*

and/or in kind. What is of relevance to agricultural modernization is the use they made of these loans. Table 4.7 shows the items on which loans were invested. More than half of the respondents said they used the money for planting expenses, the bulk of which went to

Table 4.7. Purposes for which loans were used.

Purposes	*1967*
	Percent
1. Planting expenses	58
2. Land preparation	10
3. Fertilizer	10
4. Expenses for pulling seedlings	8
5. Weeding	8
6. Insecticides	3
7. Purchase of seeds	2
8. Purchase of carabao	1
Total	100

the planters as payment. Although more expensive, straight-row planting was one of the practices readily accepted. At the time of the study, the rate was ₱4.20 a day for straight-row planters, ₱5.00 for those who used guide rows and only ₱3.50 a day for the traditional method of planting. In addition to straight-row planting, loans were spent on weeding and insecticides. This is an indication of the extent to which the farmers had begun to recognize the role of clean culture in rice production. The rice fields certainly looked neater and nicer five years later. Fertilizer and land preparation were other items of expense. Due to the decline in labor exchange among farmers for land preparation, there was more cash expenditure for the purpose. Investing money to purchase seeds was also a new development because the new rice seeds had to be bought and at a premium price. With the traditional varieties, there was no need to buy seeds; they just used what they had from their own fields.

Along with the new uses of credit, there was also a noticeable shift in sources (Table 4.8). While in 1963, 32 percent borrowed from relatives, in 1967 the most frequently mentioned sources were private moneylenders and banking institutions. The increase in patronage of private moneylenders from 23 to 38 percent is a reflection of the increased need for credit and the inability of banks

Table 4.8. Sources of loan in cash and/or kind.

Source of loan	*1963*	*1967*
	Percent	
1. Private moneylenders (including rice millers, businessmen, store owners, buyers of rice and coconut)	23	38
2. Neighbors, friends, co-farmers and compadres	22	12
3. Relatives (include parents, brothers, sisters, in-laws)	32	13
4. Institutional sources such as banks, Agricultural Credit Administration, insurance company	12	29
5. Landlord	11	8
Total	100	100

Source: G. T. Castillo, *et al., op. cit.*

and other government agencies to supply such credit although it was more needed in 1967. There was a slight decrease in the use of landlords as a source of credit, probably because lessees no longer obtained loans from them.

Pahud's[12] study likewise found a positive relationship between amount of money borrowed and adoption of recommended rice practices. This is to be expected, since use of these cultural practices requires some investment. Among the farmers who did not borrow any amount, 28 percent were low adopters and only 19 percent were high adopters. The latter were farmers who had enough capital of their own. Farmers whose loans amounted to more than ₱300 were mostly high adopters. For these small farmers, ₱300 was a sizeable amount, considering their income levels and the value of the peso at the time of the study in 1967. One can, therefore, appreciate the risks they had taken in the interest of improving their farming.

C. Innovativeness, Traditionalism and Rationality of the Rice Farmer

It would be interesting to know how the introduction and adoption of the new rice technology, in part or all of its accompanying package, have affected the rice farmer's outlook and attitudes. Data from Bukidnon actually provide more insights in view of the fact that this province is much farther away from the center of diffusion and is, therefore, less exposed to the technology. Tables 4.9 and 4.10, which include statements attempting to tap the innovativeness-traditionalism dimension of the farmer's socio-psychological world, reveal a level of innovative outlook. He wants a change in his life and in his farming and likewise recognizes the value of the instruments by which such changes may come about such as credit, new rice varieties, contact with agricultural extension workers and even cooperatives. He is a little bit ambivalent about abandoning completely the old ways or his parents' ways of farming. Much more is his disagreement with the statement that "everything you do on the farm turns out well." This response is probably colored by an experienced fact on their part because *not everything* one does on the farm turns out well. About one-third of them do not consider rice farming as a business enterprise but as a way of life.

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[12]S. L. Pahud, *op. cit.*

Table 4.9 Innovativeness of 379 lowland rice farmers in Bukidnon (1972).

Statement of innovativeness	*Agree*	*Undecided*	*Disagree*
		– Percent –	
1. Do you want to learn new ways to farm?	96	3	1
2. If an extension worker would give a talk or would hold a meeting, would you attend?	93	6	1
3. Planning and recording your activities on the farm improve your management of the farm.	86	12	2
4. A man can usually improve his living condition by hard work.	95	4	1
5. Do you think using new varieties of rice would increase your production?	85	14	1
6. Credit for capitalization is important to improve farming and increase crop production.	72	20	8
7. Do you want a change in your life?	89	9	2
8. Do you think you will live better in the future?	57	40	3
9. Do you think frequent contacts with extension workers would help you improve farming?	76	20	4
10. Do you think attending meetings called by extension workers, PACD workers and agricultural cooperative technicians are important?	88	10	2

Source: L. A. Chua, *op. cit.*

Side by side with positive endorsements of innovations are pockets of uncertainty and fatalism expressed in doubts about a better life in the future. With this goes helplessness in the face of floods, droughts, pests and diseases, and more than 70 percent put man's fortune in the hands of God. These farmers go through every year, often more than once, a cycle of natural calamities, including pests and diseases. Despite new technology, rice farming remains very much subject to the whims of nature. Even pests and diseases are in many ways a matter of God except for the breeding of disease resistance or drought tolerance into a new variety. Preventive control

Table 4.10. Traditionalism of the lowland rice farmers (379 farmers from Bukidnon), 1972.

Opinion	*Agree*	*Undecided*	*Disagree*
		— *Percent* —	
1. A farmer should farm the way his parents did.	35	13	52
2. Extension workers don't know any better than the farmers.	29	25	46
3. It is too risky to try new ways to farm.	11	23	66
4. It is better to enjoy today and let tomorrow take care of itself.	16	13	71
5. A man's fortune is in the hands of God.	72	12	16
6. Membership in agricultural cooperatives will not do any good to a farmer.	18	11	71
7. It is always safe to follow old ways of farming.	20	22	58
8. There is nothing that a farmer can do against pests and diseases, floods and droughts. Everything is in the hands of God.	52	14	34
9. Farming is a way of life and not a business enterprise.	56	10	34
10. Everything you do on the farm turns out well.	43	—	57

Source: L. A. Chua, *op. cit.*

measures have their own limitations. Incidence of pest and disease also appears to be related to weather and climatic conditions which, so far, are still under the control of God, despite successful attempts at rain-making. Rice-farming is always a risky venture and the fatalistic streaks in the farmer's outlook are a reflection of these risks. What next year's crop will bring depends very much on what Nature has in store.

The Asian Social Institute study of 50 Laguna villages showed that residents of rice-producing villages have higher scores in their attitudes toward modernization than those in villages engaged in production of other crops. The author contends that these progressive attitudes are not due to the fact that they grow rice but rather to the fact that these villages tend to be located along the national roads. More remote villages tend to grow crops other than

rice. Despite these more progressive attitudes, however, the good luck-bad luck syndrome and the dominant influence of the weather on their assessment of success or failure remain rather strong. Forty percent of the respondents believe that a farmer who has had a poor rice crop three years in a row is a victim of bad luck. About 60 percent attribute the poor crop to poor farming methods. To the statement that "the new rice varieties will not give more yield than the old varieties, for it is bad weather that causes the low yields, not the type of rice," 57 percent agreed on the adverse role of bad weather. Only 41 percent thought otherwise and gave credit to the yield potential of new varieties.[13]

Judging from the rational considerations the rice farmer applies in his decision-making (Table 4.11), he seems to be guided by the maxim that "if he does his best, God might do the rest! " The one item, however, which would make a farm management expert cry is the high proportion (61 percent) of farmers who were not keeping any kind of farm records at all. Another study which includes 180 rice farmers from eleven barrios in Laguna and Nueva Ecija where intensive programs in agricultural and rural development have been undertaken for a number of years, only an average of 40 percent used any kind of farm records, yet 70 percent of the farmers said they tried to determine cost of production. In eight of the Laguna villages, more than 60 percent attempted to look at business trends and almost 80 percent tried to determine the opportune time for marketing their produce.[14] This means that farmers have some basis for making their calculations. Experience and day-to-day contact with the hard facts of rice production are on their side and, therefore, there is probably a lot more substance to their "gut" feeling than to the survey of a farm management specialist.

So far, the experience in the Philippines with respect to the modernization or rice farming has shown that the most difficult innovation to introduce and the least accepted is farm record-keeping. Input-output analysis and cost of production figures have, therefore, been a challenging task. The Department of Agricultural Economics of the University of the Philippines at Los Baños has maintained a farm-record keeping project for the past eight years, but this involves only about 30 farmer-cooperators. This has been the source of cost of production figures for some national policies.

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[13]P. Meijs, *op. cit.*

[14]R. C. Nayga, *op. cit.*

Table 4.11. Rationality in the decision-making of 379 lowland rice farmers of Bukidnon (1972).

	Percent
1. How do you decide how much fertilizer to apply to your rice crop?	
a. According to soil test	37
b. Follow the general recommendation of extension workers	20
c. According to careful observation in trial-and-error-like procedure	14
d. On the basis of general knowledge and experience	10
e. Follow recommendations or practices of relatives	5
f. According to recommendation of salesmen	1
g. From information gained from mass media	2
h. I don't know	4
i. Always used the same amount as last year's	1
j. Used what was on hand	1
k. Used what landlord sent	5
Total	100
2. How do you decide how much rice to plant?	
a. According to market conditions	4
b. According to season and cropping pattern	43
c. According to family needs	9
d. According to general needs	20
e. Always planted the same amount	10
f. I don't know	4
g. Decided by the landlord	10
Total	100
3. Why did you plant this variety instead of other varieties?	
a. Followed recommendations of extension workers and other technicians	29
b. Choose variety to meet specific problems like disease, pest, season, climate	30
c. According to market demand or price	7
d. Because of special qualities like high yield and disease resistance	8
e. To experiment with a new variety	12
f. Recommended by relatives, neighbors and other farmers	9
g. Followed recommendations of salesmen	1
h. I don't know	3
i. Other factors beyond my control	1
Total	100
4. What kinds of written records do you keep?	
a. Farm books	16
b. Ledgers or other records	5
c. Other production records	13
d. Receipts	4
e. Bills and/or sales slips	1

Table 4.11. (Continuation)

	Percent
f. I don't know	4
g. Relies on memory	11
h. No records kept	46
Total	100
5. How do you use these written records?	
a. To estimate profit and loss of entire farming operation	25
b. Input-output analysis of specific enterprise	6
c. To aid in improvement of farm practice	7
d. To figure income tax or other taxes	2
e. I don't know	50
f. Landlord does not tell me anything about these records	10
Total	100
6. Have you tried to compute on paper what your profit was from the lowland rice project?	
a. Yes	60
b. No	38
c. I don't know	1
d. Landlord did not tell me about it	1
Total	100
7. The difference between a successful farmer and an unsuccessful one is more on how hard they work than on how much time they spend in planning their operations.	
a. Disagree	12
b. Agree	70
c. No response	6
d. It is not clear	12
Total	100
8. Farmers really don't have to think a great deal about what they are going to do on their farms since this is largely decided for them by the landlord and by what kind of farming their neighbors do.	
a. Disagree	76
b. Agree	11
c. I don't know	3
d. No response	10
Total	100
9. What would you do if your decision in using the new variety would not produce desired results?	
a. Accept consequences of the decision	32
b. Ask the extension worker reason for the failure	60
c. Blame the extension worker	1
d. No response	2
e. The landlord is responsible for it	5
Total	100

Source: L.A. Chua, *op. cit.*

Record-keeping needs creativity in format, procedures and educational approaches so that it can be effectively utilized by farmers who have an average of 3 to 6 years of formal schooling. This ability to figure out cost and returns through the use of farm records is probably the hallmark of farmer sophistication in modern agriculture. At this point, mere adoption of new varieties is no longer a distinguishing badge of innovativeness because many have taken on these varieties 100 percent.

D. Rice Farmer's Response to Disaster

In 1970 and 1971, there was "tungro" virus disease outbreak which hit the major rice-growing provinces of the country, including Central Luzon, the Bicol Region and Cotabato. When an inquiry was made as to what courses of action had been taken with respect to the disease outbreak, a foreign consultant closely associated with the national rice production program enumerated the following:[15]

> "With the local outbreak of tungro in seedfields of IR-22 in Cotabato in 1970 recommendations for insecticides for use in rice seedbeds to control the early attacks of green leafhoppers, the vector transmitting the tungro virus, were put in 'The Philippines Recommends for Rice-1970' including a kodachrome color photo of a tungro infected rice plant.
>
> "The 1970 edition of the 'Rice Production Manual' produced jointly by UPCA and IRRI contains complete data on tungro. The manual is a reference guide for extension workers and agribusiness representatives."

Beginning in mid-August 1971, concurrently and in consultation with IRRI, the Unified Rice Applied Research Training and Information Project (URARTIP) sent "tungro alert" letters to all regional and provincial rice specialists, including a full copy of the IRRI news release, and with suggestions for alerting extension workers and rice farmers.

Since then there has been a steady flow of releases on the tungro epidemic, and action, both interagency and by appropriate agencies, particularly the Bureau of Plant Industry, the Agricultural Productivity Commission and the U.P. College of Agriculture.

An interagency-tungro team held five one-day provincial meetings with all professional workers in late August, using 20,000 copies of a BPI prepared bulletin on tungro. More than 550 people

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[15]Reshon Feuer, Letter to the Dean, U.P. College of Agriculture, October 4, 1971. Unified Rice Applied Research Training and Information Project (URARTIP), National Food and Agriculture Council (NFAC).

attended the meetings in the five Central Luzon Provinces of Bulacan, Nueva Ecija, Tarlac, Pampanga and Bataan.

An interagency-prepared version of the BPI bulletin was printed for farmers by BPI and used in the four most seriously affected provinces in a series of meetings with farmer-leaders. A UPCA faculty member was the feature speaker at the Bulacan province meeting, together with speakers from IRRI and APC; this meeting which was called by the Provincial Agriculturist, was attended by 235 farmer leaders and municipal agriculturists.

The URARTIP staff provided a steady stream of tungro release materials. The UPCA Department of Agricultural Communication prepared two special "tungro specials" issues of the *UPCA Farm and Home News* that went to 600 receivers. URARTIP staff were in frequent contact with APC, BPI, NFAC, Secretary and the Undersecretary of Agriculture and IRRI in organizing interagency action on the tungro epidemic.

The national rice action officer (APC) sent a second release to regional and provincial rice specialists, inclosing the farmers' version of the tungro bulletin which contained a list of resistant varieties and suggested priority action, especially the use of the two most effective recently proven insecticides "Furadan" and "MIPCIN".

Three interagency-action committees had reported to Undersecretary of Agriculture J.D. Drilon Jr. as of September 29, 1971. Dr. Lapis, of UPCA, was chairman of the tungro action committee.

Suggestions for the next rice crop were:

1) Plant only the tungro-resistant varieties such as C4-63 G, C4-63, C4-137, IR-20 and BPI-76 (NS), and use recommended insecticides.
2) If planting non-resistant varieties, the use of appropriate insecticides is an *ABSOLUTE MUST!*
3) Several "former seed board" rice varieties which were brought to the Philippines during the early 1940's from Indonesia to combat that tungro outbreak, are resistant and can be used in this emergency. These are Intan, Peta, Bengawan and perhaps Tjeremas.

Motivation

The current main problem in dealing with the tungro situation is to adequately motivate the rice farmer to accept and to act on the flood of proven technical information being made available to him. The ultimate decision to grow tungro-free rice rests in the rice farmer.

Tungro: How Serious?

Currently, some individuals tend to panic regarding the present tungro outbreak in the Philippines. It is serious in the affected localities – affected fields of susceptible varieties untreated with insecticides will be a total loss. But the actual hectarage affected in the Central Luzon provinces as of September 21, 1971 official Bureau of Plant Industry report was 17,000 hectares. This was less than 4 percent of the 470 thousand hectares planted in 1969-70 in only the four most seriously affected provinces: Tarlac, Pampanga, Bulacan and Nueva Ecija.

In these provinces alone there were enough C4-63G and IR-20 planted during May and June 1971 (harvesting during August and September) to replant all of the 1971-72 dry-season crop throughout the Philippines three times over. Nearly 15,000 hectares of these two tungro-resistant varieties were planted during May and June 1971. At 60 cavans per hectare yield estimate (conservative) this was 900,000 cavans of potential seed of tungro-resistant HYV's.

The Bureau of Plant Industry sprayed about 10,000 hectares of the worst affected areas to reduce the infectious leafhopper population.

"The tungro-infected area in the other provinces as of the 9/21/71 BPI report was about 3,000 hectares, mainly in the Bicol Region and in South Cotabato, the latter being the site of the 1970 outbreak.

"Because of the continuing infestation in South Cotabato in 1971, it is recognized that stringent precautionary measures are necessary for future rice crops in the Central Luzon Area: the use of resistant varieties and insecticides are being brought to the attention of rice growers in a massive extension teaching program getting underway.

"Tagalog versions of the interagency tungro bulletin are in progress – the first edition will be off the press on October 1, 1971."

The above letter is reproduced here in detail because it underscores certain assumptions made in development programs, which influence implementation and performance. The basic assumption in this case is that there is an effective communication system such that whatever is scientifically known about "tungro" is passed on to and understood by extension workers. A second assumption is that extension workers and other professional workers and farmer-leaders go out of their way to extend to the farmers the information, explanation and procedures for dealing with the problem. A third assumption is that the farmers understand, know

how and have the means to comply with the recommended procedures. For example, if 20,000 copies of a bulletin on tungro were distributed, the question is: How many farmers received these bulletins? Of those who received, how many read, understood and complied with the suggestions?

Quite apropos to this particular situation are the findings of the Montecillo study on *Uses and Effects of Interposed Agricultural Communication* which illustrate the gap between the verbal culture or the symbolic component of agriculture and the first-level production problem. The study shows that press releases and radio farm news are effective channels of communication insofar as the person-mediators such as extension and community development workers are concerned. The first-step flow which traces the link between the mass media and the person-mediators was empirically supported. The findings indicate that the person-mediators not only used the press release and radio farm news but were also affected by them, that is, they gained knowledge, developed comprehension, and underwent behavior change. However, there was no second-step flow concerning the passing of information from the person-mediators to the farmers. Mass media with the exception of radio had practically no use nor any effect on farmers. Printed materials could be effective with person-mediators but they did not seem to be of much use to farmers. The absence of the second-step flow of information and influence reaching the farmer could very well represent the distance between verbal culture and the practical world of realities in agricultural production.[16]

An anthropologist (Brian Fegan) residing in a tungro-infested area in Central Luzon at that time has some observations which illustrate the lack of such a second-step flow of information. He writes:

> "The information campaign on resistant seeds and protective methods was a complete failure here. Publicity in English in the *Sunday Manila Times* was ill-directed. It should have been in Tagalog and in *Taliba, Pilipino Star,* etc., which are the papers farmers read. Instead, too, of the scientific form of advice, it should have been the form of a recipe. Farmers here have planted two crops since January when the pattern of tungro infestation became known to the authorities. A lot had their fingers burned on the first crop with R5 and R8, but the normal pattern is to

[16]Catalina M. Montecillo, The Uses and Effects of Interposed Agricultural Communications. Unpublished M.S. Thesis, University of the Philippines, College of Agriculture, 1970.

plant Wagwag in October. None of the published information I saw took account of this – all the advice on what to plant was concerned with the new seeds, didn't mention effects of tungro on old and popular high-price varieties. Hence, neither publicity nor experience helped redirect them to resistant varieties.

"Another problem was the scarcity of seed of resistant varieties for the few who had heard of it. There seems to have been infrastructure program to ensure that seed was available. I suppose the rice shortage exacerbated this, and caused R20 and C4 that should have been reserved for seed to go into the markets of Manila. The result here was that farmers took seed from the just harvested crop, that was still dormant, and got a poor showing in their seedbeds. This led them to distrust the "resistant" seed, as they wasted palay and the need to sow extra seed fouled up planting schedules. Again, the local term for any spray or dressing for disease or insect is *gamot,* which means the same as medicine. The publicity that filtered down did not make it clear that spraying is a preventive and not a cure. Result, farmers hit by tungro have wasted gallons of spray and gone into debt for it and it didn't work. This has not helped the general popularity of spraying.

"One thing that strikes me is the scarcity of advice about sprays, etc, and for what purposes they are effective. Is there any chance that the makers could be persuaded or required to provide this, plus cautions in the main local languages?

"I have had a chance to observe the local extension bloke from the Land Reform at work in one of his rare visits here. Instead of agricultural advice, he was concerned with publicizing the new land reform code. The elections had something to do with that, I suppose. But the point is that, that is the way things work out at all levels. The Land Reform blokes are all playing politics, and have limited opportunity to canvass farmers with farming advice. Point is, What to do? That is why I feel extension advice ought to go in *Taliba.* The extension blokes probably do read the *Sunday Times* in English, but that is no guarantee they pass it on, even if they are perfect they have very large areas to cover. Seminars at Los Baños have had valuable effects, but a one-shot program needs follow-up. Pamphlets I picked up down there in Tagalog have done the rounds here, and are popular reading. Their effects are so far unmeasurable.

"But an opportunity for extension economy using the existing seminar methods is being wasted, in not picking up the *katiwalas* of the large owners. I am not in favor of strengthening the owner's hand, but the katiwalas are all over the place and checking up on farmers' harvest shares, secret harvesting, etc.. They also are the contract men for farmers trying to borrow from the owner for seed, fertilizer and spray or equipment. That is to say, they are built-in unpaid extension workers if someone just makes sure they are picked up for their multiplier effect. At the moment, they

are no better informed than the farmers. One has given me the locally popular explanation of tungro: that after the twenty-day or so dry period last August the rain all came from the east. Now rain coming from the China Sea picks up salt, and if the palay is dried out, the salt damages the roots, causing what is like a cancer. That is tungro. When the west wind blows, from late October on, it has no salt in the rain it brings, and the tungro will disappear. It doesn't matter therefore what seed one plants, the tungro is over for the year. One katiwala visiting twenty farms with that tale can do a lot of damage. Point is he might be used to carry a more accurate tale, and the existing lousy land system made to do a little to earn its keep.

"These peasants or proletarians or whatever are really quite open to change in technique that works. The spread of the IR varieties is a case in point. But an unwritten story is the spread of threshing tongs (*piyuka*) and the triangular threshing stand to replace the foot threshing. That has happened in the last six or so years, I think unnoticed. Farmers and landless harvesters both give an explanation in terms of speed, recovery, and economy." (Letter dated November 10, 1971).

Based on recent experiences with rice farmers in their rapid acceptance of new technology, one is not inclined to agree completely with Feur's conclusion that the *main problem* in dealing with the tungro is to "adequately motivate the rice farmer to accept and to act on the fold of proven technical information being made available to him." Before a farmer can act, he has to receive and comprehend "the flood of proven technical information."

A follow-up study on the incidence of tungro in Gapan, Nueva Ecija and farmers' reactions to it[17] revealed that farmers located in areas given first priority on rational basis for water use in that year had been able to plant earlier and for the most part escaped severe damage to crop yields. Although tungro-resistant varieties were also affected in badly infested areas, it was still very evident that they produced higher yields than the susceptible ones even under the worst conditions. The presence of such varieties in sufficiently noticeable areas, enabled the farmers to judge for themselves which varieties had better resistance. These observations had consequently influenced their preferences for the succeeding crops. Interviews with 100 farmers showed that 43 of them sprayed their fields and 18 drained water from the fields but they observed little, if any, effectiveness from these practices. With very few exceptions, farmers

[17] Randolph Barker, *et al.*, The Changing Pattern of Rice Production in Gapan, Nueva Ecija, 1965 to 1970. IRRI Seminar, December 11, 1971.

did not understand what caused the disease nor did they know what protective measures to take to prevent another occurrence, other than to plant a resistant variety. Only 19 of the 100 farmers associated the disease with the green leafhopper. In later field visits, farmers were seen to be planting resistant varieties but they did not know of other protective measures nor did they associate the green leafhopper with the virus.

Soon after the tungro infestation, Herrera's study in Gapan reported that 97 percent of the farmers obtained lower incomes from their rice crop in 1971 compared with the 1970 crop due to the tungro which adversely affected their yields. Naturally, they also expressed dissatisfaction with these yields but expected better incomes in the next five years from a combination of improvements in farming methods, hard work, and new technology. Only one respondent mentioned stable price as a factor. On the more immediate action to take with respect to problems encountered, the most frequently mentioned of which were disease and insects, farmers would resort to the use of chemicals and change their varieties to more resistant ones. This latter course of action means changing to other HYV's. Of the 193 respondents only 10 said they were no longer willing to use HYV's in the future. The experience with tungro was the reason given for this unwillingness.[18] For 95 percent of the farmers studied who were affected by tungro, they were still keeping faith with HYV's.

The response of Davao del Sur farmers to a series of disasters was less encouraging than that of Gapan farmers. The overall average yield reported by Stewart in two barrios of Davao del Sur was about 60-61 cavans per hectare. These low yields were explained by two factors: the tungro disease and the extremely limited use of fertilizer. Nearly two-thirds of the 161 farmers interviewed used no fertilizer at all for the season in question. Those who applied fertilizer used only an average of 1.4 bags per hectare. Only 5 farmers used 3 or more bags per hectare. Stewart attributes this limited use of fertilizer to successive crop losses due to typhoon, rat infestation and tungro epidemic. The crop losses had taxed their financial resources and credit. Furthermore, landlords were reportedly not sharing in costs of seeds, fertilizers and chemicals; therefore, the tenants had to absorb the losses. Declining expenditures for farm inputs as a consequence of

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[18] R. T. Herrera, *op. cit.*

these unpleasant experiences were interpreted by Stewart as a pattern of risk avoidance.[19]

Table 4.12 shows the decline by about half in the percent of farmers using chemical fertilizer. Insecticides and herbicides continued to be applied but in lesser quantities. The unpopularity of straight-row planting, the complete absence of the mechanical weeder, the dependence on the mechanical thresher, the widespread use of the two-wheel tractor and the application of herbicides, were related to the seasonal labor shortages arising from the continuous cropping pattern and alternative employment activities offered by sugar-cane and coconut plantations nearby.

Table 4.12. Changes in farming practices, 1967-1972 in Hagonoy, Davao del Sur.

	VILLAGE			
	Sinayawan		*Beinte Nueve*	
	Main crop 1967	*Main crop 1972*	*Main crop 1967*	*Main crop 1972*
Number of farmers	95		66	
% using chemical fertilizer	89	41	83	39
% using organic fertilizer	2.1	1.0	3	1.5
% using insecticides	99	100	100	100
% using sprayers	99	99	92	92
% using herbicides	97	95	98.5	98.5
% using straight-row planting	36	17	62	18
% using mechanical weeder	–	–	–	–
% using 2-wheel tractor	93	87	88	73
% using 4-wheel tractor	–	–	–	–
% using mechanical thresher	98	96	98.5	94
% farms irrigated by gravity	100	100	100	100

Source: James Stewart, *op. cit.*

[19] J. Stewart, *op. cit.*

E. Rice Farmers' Values on Education

Although most Filipino rice farmers have an average of 6 or less years of formal schooling, one of their undisputed aims in life is to have their children go to college. Tables 4.13, 4.14 and 4.15 present data from Bukidnon and Laguna. The former study shows the unequivocal faith which Bukidnon rice farmers had on the desirability of college education as a "passport" to better jobs, better life and better social standing. This abiding faith of parents in what college education promises for the future holds for both male and female children. There were only 3 items which elicited less consensus, i.e., high school education was regarded as enough preparation by 35 percent of the respondents and 16 percent agreed on the undesirability of going to high school or college because it takes children away from the farm. The diploma-oriented push for college education was substantiated by two-thirds of the respondents who agreed that "the most important thing in education is to get a diploma or a degree." It must be mentioned here that although the rice farmers had an average schooling of 6 years their children had already an average of 2 years in high school and 21 percent, college education at the time of the interview. This means that the children's formal schooling would be so much more than their parents'.

Table 4.13 Bukidnon lowland rice farmers' value on education (1972), N=379.

	Agree	*I don't know*	*Disagree*
		– Percent –	
1. Going to high school or college will take people away from the farm and because of this, it is undesirable.	16	5	79
2. High school education is enough preparation.	35	5	60
3. Going to school is not really important.	5	1	94
4. Good education helps a person lead a better life.	95	2	3
5. Young members of the family should get all the education they can.	95	1	4
6. The most important thing in education is to get a diploma or a degree	66	4	30

Table 4.13 (Continuation)

	Approve	*Don't approve*
	— *Percent* —	
7. Would you like your son to go to college?	100	
8. Would you like your daughter to go to college?	99	1
9. Young men need college training to get along well.	99	1
10. College education gives children greater opportunity to get the best jobs.	99	1
11. College education would give your children a better life and social standing than yours.	99	1

Source: L.A. Chua, *op. cit.*

Table 4.14. Attitudes toward education among farmers and non-farmers in 50 Laguna barrios. (6,361 respondents) (1972)

Attitude statements	*Percent*
1. A child of 14 who has completed 2 years of high school is offered a job. If you are the parent, what would you advise the child?	
a. Accept the offer and start working	33
b. Refuse the offer and finish high school	66
c. No answer	1
2. Once I heard a friend say that girls do not need to study as much as boys do. Girls will get married and will stay only at home, so their study is useless.	
a. Agree	22
b. Disagree	77
c. No answer	1
3. There is no need to have a diploma. You can also get a job without one.	
a. Agree	35
b. Disagree	64
c. No answer	1
4. When a child will become a farmer, he does not need to finish high school. Working in the field needs only experience.	
a. Agree	34
b. Disagree	65
c. No answer	1

Table 4.14 (Continuation)

Attitude statements	*Percent*
5. With what statement do you agree?	
a. Some people say that barrio leaders must have at least a college degree.	43
b. Others say, everybody who is intelligent can be a barrio leader.	56
c. No answer	1
6. Agricultural seminars are not very useful for the farmers because they are only theoretical.	
a. Agree	34
b. Disagree	65
c. No answer	1
7. Children learn more from older people than in school.	
a. Agree	26
b. Disagree	73
c. No answer	1
8. In the province, children don't need high schooling because there is no office work available.	
a. Agree	24
b. Disagree	75
c. No answer	1
9. When a person had passed the age of 35, it would not be any use to take up studies.	
a. Agree	25
b. Disagree	74
c. No answer	1
10. A child who is at school the whole day should stay away from his books at home to be able to help in household chores.	
a. Agree	20
b. Disagree	79
c. No answer	1

Source: Paul Meijs, *op. cit.*

Table 4.15 with data from farmer- and non-farmer respondents from 50 Laguna barrios reveals a little more realism but the high value on education still dominates. Between taking a job and continuing on to high school, majority would still opt for the latter. Only a little over 20 percent are willing to put girls at a disadvantage in schooling on the ground that marriage will just keep them at home anyway. More than a third believe that one could obtain a job without a diploma and that a high school education is not necessary if one is going to become a farmer. A similar number look at agricultural seminars as theoretical and, therefore, not very useful. Just like the

Table 4.15. Farmers' educational aspirations and expectations for their children (7 Laguna barrios).

	Aspirations		*Expectations*	
	1963	*1969*	*1963*	*1969*
	—Percent—			
1. Elementary	29	8	47	29
2. High school	21	21	14	30
3. College	36	69	6	14
4. Don't know	8	1	27	21
5. It's up to them to decide	6	1	6	6
N = 370	100	100	100	100
Farmers' occupational aspirations and expectations for their children				
1. Farming	22	4	38	25
2. Blue-collar job	19	16	20	20
3. White-collar job	31	53	6	10
4. Don't know	11	6	30	31
5. It's up to them to decide	17	21	6	14
N = 370	100	100	100	100

Source: G. T. Castillo, *et. al., op. cit.*

Bukidnon farmers, the Laguna respondents do not agree that farm and household chores are not more important than schooling. The lack of office work in the province is not accepted as a reason for not pursuing secondary education. Furthermore, being older than 35 does not make it useless to take up studies. The room for adult education type of activities is, therefore, an open one.

The dream, the aspiration, and the future is one thing; the reality is another. Shifting educational and occupational aspirations and expectations are evident in Table 4.15. The following trends have been observed in the changes from 1963 to 1969:

(1) There was a general rise in levels of parental aspiration for their children both for education and occupation. The proportion of household heads wanting college education for their children almost doubled from 36 to 69 percent with a corresponding reduction of

those wanting only elementary schooling (29 to 8 percent). Those desiring white-collar occupations increased from 31 to 53 percent. The reduction in those whose original aspirations were for their children to become farmers was from 22 to only 4 percent.

(2) Heightened parental aspirations were also accompanied by greater expectations. Those expecting high school education increased from 14 to 30 percent and from 6 to 14 percent for those expecting college education. Expectations for white-collar occupations increased likewise from 6 to 10 percent.

(3) There were more "don't knows" for expectations than for aspirations. Apparently these parents knew what they wanted for their children but there was a high degree of uncertainty as to whether they could get what they wanted.

(4) Within a six-year period, the shift in aspirations and expectations was toward college education and white-collar occupations. The dreams and expectations of parents for their children were definitely away from farming in spite of some improvement in material level of living, increased income attributed to increased yields by a majority of the respondents and despite their modernizing outlook in farming. Apparently, even the changes in farming did not made it attractive enough to make them want their own children to be in it. Furthermore, college education which they aspired for was not associated with farming. As a matter of fact, among these farmers, they could not understand why persons with college degrees such as agricultural extension workers would work in the village and get their feet muddy. However, it is too stereotypic to conclude that this college degree and white-collar orientation necessarily meant a dislike for manual labor. A more plausible explanation seems to lie in the attraction to an occupational syndrome marked by less physical hardship, greater income stability, less exposure to the risk of natural calamities, and in many instances, higher income and security for the future. Among some of these farmers studied, however, there were those who definitely earned more than teachers and government employees in the light of recent yield levels they had achieved. Perhaps, it was precisely because of these gains in farming that respondents aspired more and expected more because they could afford to offer a little bit more to their children.

(5) The biggest differential observed in Table 4.15 is between level of aspiration and expectation both for education and occupa-

tion. While 69 percent were for college education, only 14 percent expected this to happen, considering their available means of livelihood. While 53 percent wished their children could have white-collar occupations, only 10 percent expected this to happen. When faced with the realities, 25 percent of the parents thought their children would also be farmers although only 4 percent wanted them to be such.

The other type of differential which can occur but which is not shown by the data at hand is that between expectation and actual fulfillment. How many of those who expect their children to be in white-collar jobs would eventually have the satisfaction of seeing them get there? In terms of the larger social issues frequently being raised nowadays, which of these two gaps contribute to social frustration, the *aspiration-expectation gap or the expectation-fulfillment gap*?

The degree to which fulfillment of aspirations and expectations has taken place may be gleaned from a larger study of which 7 villages reported above were a part.[20] In 1968, only 6 percent of farmers' children were enrolled in college or had gone to college; 22 percent were in high school; the rest were in the elementary grades, for 9 percent already 7 years old had not yet gone to school.

In terms of occupation, the proportion who were working as hired labor increased from 46 percent in 1963 to 55 percent in 1968 The explanation given by the authors for these two trends was that major operations in land preparation such as plowing and harrowing were being done more with the hand tractor which was either hired or owned. Farming activities were also being performed more in a business-like manner. Additional farm labor such as transplanting and weeding were now hired and paid. Therefore, instead of helping on the family farm for free, other members of the family worked as hired laborers for somebody else. This might be the reason for the 10 percent reduction in the number of children who helped their parents on the farm and the 9 percent increase in the children who worked as hired laborers. Only 2 percent of the children were in white-collar jobs, 10 percent in blue-collar work, and 2 percent were farmer-cultivators. The probabilities therefore of farmers' children attaining college education and acquiring white-collar occupational status were very slim. Their prospects of becoming farmer-operators were not very good either due to scarcity of land for

[20]Farm and Home Development Office, Rural Change in a Philippine Setting. University of the Philippines, College of Agriculture, College, Laguna, 1971.

all the children to cultivate. So far, being a hired farm laborer seemed to be a more realistic expectation.

But dreams of fulfillment persist regardless of how well or how badly rice farmers are doing. Increasing modernization in rice farming has not made the occupation encouraging enough for farmers themselves to wish it for their children. As a matter of fact, improvements in livelihood due to output increases provide more resources for educating children away from the farm. The desire is still for their children to find a better life through college education and non-farm occupation. So far its non-fulfillment seems to be accepted. What is the choice, anyway?

F. Income and Life's Amenities

Even if farmers do not keep cost accounts, debit-credit ledgers, and farm and home budgets, they seem to have a pretty good idea of how they are doing. Of course, the adequacy of one's income depends not on its absolute value but more on what one can do with it relative to what he wants. When the Laguna farmers in 7 villages[21] were asked to assess their 1969 income compared with what they had in 1963, 41 percent reported an increase; 28 percent decrease; and 31 percent, the same (Table 4.16). They were then asked to state reasons for the assessments they made. Fifty-three percent of those who said their income decreased attributed it to poor yield from their upland crops and from rice due to the typhoon and the drought (Table 4.16). Insufficiency of income due to higher cost of living and lack of steady and additional sources of income were also mentioned. Although cited only by 9 respondents, the loss of the land or reduction of area being cultivated is of concern because we can anticipate more of this phenomenon with the increasing population pressure on cultivable land.

For a more direct consequence of the improvement in agricultural productivity, Table 4.16 provides encouraging data. Sixty-four percent of those who said their income increased attributed it to increased rice yield and 16 percent mentioned additional sources of income from farm jobs. Conversion to leasehold was regarded as the key to increase income only by 3 percent. What is noteworthy in these findings is summarized by one farmer who said: "My income increased when my yield increased. Even if I am a share tenant,

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[21] G. T. Castillo, *et al., op. cit.*

Table 4.16. Farmers' evaluation of 1969 income level compared to 1963 (370 farmers from 7 Laguna barrios) and reasons for their evaluation.

A. *Evaluation*	*Percent*
1. Increased	41
2. Decreased	28
3. The same	31
	100

B. *Reasons for saying their income decreased or remained the same as 1963*

	Decreased income		*Same income*	
	N	*Percent*	*N*	*Percent*
1. Income still insufficient (increase in cost of living; no savings)	18	18	36	32
2. No steady and/or additional sources of income	14	14	9	8
3. No change in source and amount of income	–	–	42	40
4. Poor yield from coconuts, bananas due to typhoon and in some cases plants have no fruits yet	22	22	6	5
5. Poor rice yield due mostly to the drought and in some instances, disease, lack of capital and use of old variety	31	31	12	10
6. Farmer is still a share tenant	–	–	2	1
7. No more land being cultivated or size of farm being cultivated has been reduced	9	9	3	2
8. Illness and old age	7	6	3	2
	101	100	113	100

C. *Reasons for saying their income increased.*

	N	*Percent*
1. Increased rice yield	92	63
2. Availability of additional sources and some livestock	23	16
3. Plants such as bananas, coconuts and coffee have begun to bear fruits	9	6
4. Increase in wages	6	4
5. Share tenant became a lessee	6	4
6. Farmer acquired a farm to cultivate or increased the area being cultivated	9	6
7. Price of crops has gone up	2	1
	147	100

Source: G. T. Castillo, *et al., op. cit.*

my share also increased." Bearing in mind that only a few of the farmer-respondents were lessees, the majority of those who reported increased income due to increased yields were share tenants.

Despite this development, much has to be done to help raise the levels of those (59 percent) who felt their income decreased or remained the same. Furthermore, only two farmers paid attention to the price of crops. The market orientation therefore needs to be enhanced and an alternative to the present system of marketing-credit tie-up has to be found. When expected harvests are pegged to advanced loans, the creditor and not the farmer dictates the price and, therefore, on the part of the farmer, price is not a factor in marketing decisions. As a matter of fact, at this point, there is no longer any decision-making in marketing.

Closely related to the increase in income levels is the change in the material comforts and trappings of everyday life. As it is picturesquely described by A. M. de Guzman:

"Houses in the project are similar to those which can be found in most of the poorer barrios in the country. Each home is made of light materials like bamboo, buho, nipa or cogon with galvanized iron sheets being occasionally used for roofing materials.

"The house is ordinarily a one-to two-room affair, sometimes with a makeshift division between the kitchen and the all-important multipurpose receiving-dining-bedroom-sala-porch area. Here the farmer and his wife may receive their guests, while away their time, eat and sleep. Generally what passes for furniture is a bench called a 'bangko' which if present would be offered to a visitor. Wallpaper consisted of cutouts of favorite screen personalities or faded formal photographs with the subjects peering at the camera uneasily and stiffly. When night came, the multipurpose living room automatically became a bedroom by spreading a large mat which was shared in groups by threes or fours, depending on the size of the household. If the visitor stayed overnight, the farmer would graciously offer the living room and he and his family retired in the kitchen even if the division between the kitchen and his room was more imaginary than real. This kitchen had no form of drainage whatsoever and so kitchen water remained under the house, creating a very muddy, smelly, unsanitary condition. Built with an open hearth of flimsy flammable structure, it also had few utensils to speak of. Pots, a basin, two ladles, a turner, frying pan, a kettle and a few utility plates for eating and other purposes cluttered the kitchen. A drinking glass or two for the entire family completed the setup. Spoons and forks, if there

were any, were reserved for very special occasions. Drinking water was usually stored in earthen jars and not always provided with a dipper so that one had to dip into the jar with the common drinking glass. Toilets were rarely found and whatever existed were no more than dug holes. The majority of the people answered the call of nature under bamboo clumps, banana plants and bushes. Stray animals always helped dispose of whatever waste there was."[22]

Over a six-year period, changes in material level of living had become evident. Houses made of more durable materials like wood, concrete hollow block and galvanized iron roof had increased from 5 percent in 1963 to 26 percent in 1969. There were marked increases in the proportion of households possessing specific items such as chairs, tables, benches, cabinets, bedrooms, beds, kitchen drains, kitchen sinks, stoves, radios, sewing machines, toilets, and sources of water for household consumption. The improvements came not only in quantity but also in kind. An over-all comparison of 1963 and 1969 levels of possession of different household items shows a doubling (23 to 49 percent) of households having 10 or more items. Hence, after six years, and after increased income from increased yields, life for these rice-farming households was still poor but less miserably so, at least as far as material comforts are concerned.

Shand, commenting on the 41 percent who assessed their income as being *greater* in 1969, 28 percent who said *lower* and 31 percent who said *the same* (Table 4.16), came to the conclusion that the average change was close to zero.[23] This judgment on the magnitude of change is an arithmetical one – which is filled with pitfalls. Following his logic, an average of zero can actually be arrived at in three ways such as (a) 50 percent decrease and 50 percent increase; (b) 100 percent no change; and (c) 30 percent decrease, 30 percent the same and 30 percent increase. If change were assessed in this manner, it would be difficult to register any change at all anywhere. As a matter of fact, one of the burning issues generated by the green revolution is centered on the "whys" of the *increase, decrease,* and *status quo.* Table 4.16, for example, indicates that 32 per-

[22] A. M. de Guzman, *et al.,* Work Roles of Barrio Extension Workers in a Cooperative Rural Development Project: An Analysis. Farm and Home Development Office, University of the Philippines, College of Agriculture, 1969.

[23] R. T. Shand, "An Interim Judgment," in *Technical Change in Asian Agriculture.* Australian National University Press (forthcoming).

cent of those who reported the same income status attributed this assessment to increase in cost of living and the fact that their income was still regarded as insufficient. Those reporting decrease in income cited poor rice yield due to drought, disease, lack of capital and use of old rice varieties. On the other hand, increased rice yield was held as mainly responsible for the increase in income. Considering the reasons cited by the rice farmers for the assessment of their incomes, a verdict of zero change is hardly acceptable and this becomes less so when one looks at perception of status differences within the village.

To the question: "In what ways do you think people in your village differ with respect to their status in life?", the most significant response in 1963 was : "There are no differences in status here; we are all poor." (Table 4.17) One-fifth of the respondents gave this reply. Thirteen percent did not know how people differed in status; 12 percent mentioned differences in tenure status, while a total of 21 percent gave responses pertaining to relative wealth or poverty. An analysis of the responses belonging to this particular category reveals that when they mentioned "rich" and "poor", it did not have the same meanings as rich and poor in the social class sense of upper and lower class, because there were no really rich people in these barrios. This meaning is evident in such expressions they used such as: "some are poor;" "some are a little bit better off;" "some have sufficient means for everyday needs; others don't." In other words, the concept of rich and poor is really more a matter of some being poor while others have a little more, although many respondents emphasized that there were more people who were poor than those who were better-off. The notion of sufficiency-insufficiency was related to life subsistence character of existence in these barrios and sufficiency in the most essential necessities of life was already regarded as a better-off situation.

In 1969 only 2 percent of the respondents said there were no perceived differences in barrio people's status in life. Apparently, there was either more consciousness as to what makes for status differences or more actual basis for differentiation. Perhaps the perception of "being all poor" had become less descriptive of the situation in the barrios after 6 years. Besides the marked reduction from 20 to 2 percent of respondents who perceived no differences in status, the following other changes may be gleaned from the data in Table 4.17: (1) a drop from a total of 21 to 14 percent among those

Table 4.17. Rice farmers' perceptions of status differences within the village.

Source of status differences	1963		1969	
	N	*Percent*	*N*	*Percent*
1. No perceived differences in status	72	20	6	2
2. Relative wealth or poverty:				
(a) Some are rich; some are poor	18	5	13	4
(b) Some are poor; some are a little bit better-off	50	14	28	8
(c) Some have sufficient means; others don't	9	2	7	2
3. Status in farming:				
(a) Difference in tenure status	43	12	38	10
(b) Differences in size of land being cultivated	3	1	19	5
(c) Differences in yield	1	–	8	2
(d) Differences in types of farming, such as lowland or upland rice, coconuts, etc.	16	4	3	1
4. Occupations engaged in:				
(a) Differences in source of livelihood	20	6	52	14
(b) Employed or unemployed	7	2	6	2
5. Personal outlook in life:				
(a) Differences in individuals' drive to improve their livelihood (lazy or industrious)	29	7	52	14
(b) Differences in ability to take a long-range or short-range view	3	1	4	1
(c) Differences in ability to respond to new ideas	6	2	10	3
(d) Differences in outlook arising from varied places of origin, religion and politics	10	3	12	3
6. Attitudes toward self and others in the community (everyman to himself, no unity)	25	7	31	9
7. Availability of capital and resources	2	1	20	6
8. Luck	1	–	15	4
9. Don't know how people differ in status	45	13	38	10
Total	362	100	362	100

Source: G. T. Castillo, *et al., op. cit.*

mentioning notions of relative wealth or poverty; (2) increase in those who became aware of differences in source of livelihood and in those who saw differences in individual drive to improve livelihood. Source of livelihood differed in terms of farm or non-farm but more with respect to whether one was a farmer or a mere farm laborer. The distinction from the content of the response was greater in this aspect than that between share tenant and lessee. What is crucial for being better-off in the barrio was having land to cultivate whether or not one owned it. From this study, informal conversations and observations,[24] "the lowest guy in the totem pole" was he who had no land to work on and was therefore dependent on available but unstable farm jobs. The increased attention on difference observed in individuals' drive to improve their livelihood (from 7 to 14 percent) also deserves comment because the responses specifically stated: "some are lazy;" "some are industrious"; "some work hard even when they already have, while others don't have and yet do not work hard." This trend might be explained by the fact that with the introduction of an agricultural development project, emphasis on improving rice production brought certain opportunities for improvement in livelihood and therefore there were those who were willing and able to take advantage of the opportunities, while others had been less responsive or less able.

The third type of change occurred in the emergence of criteria which were not or were hardly mentioned in 1963. These include difference in size of land being cultivated, differences in yield, and availability of capital and other resources. Again here, the developments in rice production seem to be relevant. For example, farmers with bigger areas to cultivate would have that much more potential for having more total harvest. Yield differentials were also emphasized. Finally, those who had available capital were better able to take advantage of new farming methods and business opportunities than those who were lacking in such resources.

Data from Gapan, Nueva Ecija are more dramatic with respect to farmers' evaluation of their rice profits and their general livelihood (Table 4.18). Seventy-five percent claimed their rice profits were higher in 1970 than in 1965. This was attributed mainly to high yield. Assessment of their level of living for the same periods had a similar trend, with 69 percent reporting that they were better-off in 1970 than in 1965. Being better-off was closely tied to increased farm income and high yield, with 9 percent mentioning increased off-farm

Table 4.18. Rice farmers' evaluation of their rice profits and level of living
(193 farmers from Gapan, Nueva Ecija, 1972)

	Rice Profits								*Levels of Living*											
	1970 Compared to pre-HYV (1965)				*1971 Compared to 1970*				*1970 Compared to pre-HYV (1965)*				*1971 Compared to 1970*				*Present livelihood of people in the barrio who depend on rice farming compared to 5 years ago (Pre-HYV)*			
	Mahi-pon	*Malim-ba*	*San Nico-las*	*To-tal*	*Mahi-pon*	*Malim-ba*	*San Nico-las*	*To-tal*	*Mahi-pon*	*Malim-ba*	*San Nico-las*	*To-tal*	*Mahi-pon*	*Malim-ba*	*San Nico-las*	*To-tal*	*Mahi-pon*	*Malim-ba*	*San Nico-las*	*To-tal*
	— *Percent* —								— *Percent* —								— *Percent* —			
Higher	75	59	92	75	1	2	4	2	72	50	57	69	1	–	4	2	97	45	90	77
Lower	25	39	4	24	99	98	96	96	27	39	35	24	99	98	92	97	–	33	7	12
Same	–	2	4	1	–	–	–	2	1	11	8	7	–	2	4	1	3	22	3	11

Reasons for higher rice profits		*Reasons for lower rice profits*		*Reasons for being better-off*		*Reasons for being worse-off*		*Reasons for being better-off*	
High yield	90%	All due to *Tungro* rice disease infestation		High yield	30%	Poor harvest & income	81%	Improve yield	50%
High price of rice	7%			Increased farm income	60%	Tungro disease	11%	Improvement in standard of living, housing & other mater'l goods	25%
Double cropping	3%			Increased off-farm income	9%	No harvest, no income	5%		
N = 144				Decreased *depen'ts*	1%	High cost of living	3%	Shift to leasehold	13%
Reasons for lower rice profits				N = 133	100%	N = 155	100%	Improved income	212%
Damage from typhoon drought & rats	53%			*Reasons for being worse-off*				N = 146	100%
Low harvest	41%			Low yield	83%				
Lack of capital	6%			High cost of living	17%				
N = 47				n = 47	100%	N = 47			

Source: R. T. Herrera, *op. cit.*

income. Reasons for being worse-off focused on low yield. General livelihood for people dependent on rice farming was considered better-off in 1970 than in 1965 by 77 percent of the respondents. The reasons cited again mentioned improved yield. Twenty-nine percent dwelt on the effects on standards of living and material amenities acquired. The salutary effects of shifting to leasehold was specifically mentioned by 13 percent. One would have expected a greater salience of this factor, considering that Gapan, Nueva Ecija is a pilot area in land reform.

The ups and downs of livelihood in rice-growing villages go with the ups and downs in rice yield. In 1971-72 a serious infestation of the tungro rice disease brought down all the yields. As indicated in Table 4.18, poor harvest was the major reason for being worse-off in 1971 than in 1970. The seriousness of this calamity may be gauged by the fact that 96 percent of the farmers reported lower rice profits and consequently lower level of living.

To the watchers of the "green revolution evils," Table 4.18 provides further fuel to the fire. San Nicolas which was a good irrigated village, as expected, showed the highest proportion of farmers reporting higher rice profits and higher level of living in 1970. compared to 1965; however, Mahipon, the rainfed barrio had higher proportion reporting similar response than Malimba (irrigated but water system has problems). In other words, considering its physical disadvantage, the rainfed barrio should have been the least likely village to report higher rice profits. What is even more amazing is that 97 percent of the Mahipon farmers claimed that livelihood of rice farmers in 1970 was better than in 1965. This proportion is higher than for San Nicolas (90 percent) and only 45 percent for Malimba. Apparently, the rainfed farmers were more aware of their gains compared to their 1965 situation, although relative to the irrigated barrios, their yields were much lower. On the other hand, the farmers in Malimba where an irrigation system was located, had greater expectations and more frustrations because the irrigation was not well functioning as it should. San Nicolas which had good irrigation also had good yield performance. When farmers in the 3 villages were asked about the most significant change in rice farming since 1966, about 92 percent mentioned this plus the shift to leasehold. Their hopes for the future were also pinned on the promise of the new technology (Table 4.19), with 95 percent expecting higher income in the next 5 years. They also unanimously

Table 4.19. Gapan rice farmers' expectations on income and farm improvements.

A. Percent farmers expecting higher income in the next 5 years

Higher	95%
No	5%
N = 193	100%

Reasons for expecting higher income:

(1) Yield-oriented reasons with emphasis on new technology and recommended production practices	55%
(2) Will work harder	21%
(3) Will have other sources of income	14%
(4) Vague feelings of optimism	10%
	100%

B. Can farming still be improved?

Yes	99%
No	1%
N = 193	100%

Ways of improving rice farming:

(1) Sufficient capital	23%
(2) Application of new technology	21%
(3) Solve irrigation/water supply problem	28%
(4) Solve rice disease infestation	10%
(5) Work harder	9%
(6) Mutual cooperation between farmers and technicians	1%
(7) Cooperation among farmers	1%
(8) Government help	6%
(9) Educating farmers	1%
	100%

Source: R. T. Herrera, *op. cit.*

believed that farming could be still improved. Again, their perceived means of accomplishing this was a combination of the new technology, irrigation water, and sufficient capital.

Again, changes in tenurial structure as one way of improving farming did not surface in any of the responses. When asked about the major problems they were faced with in rice farming, only 1

percent of the farmers mentioned being a share tenant. The most frequently mentioned problems were lack of capital, rice disease and water supply.

Given a chance to achieve increased incomes, what do rice farm families do with their newly found "wealth"? Table 4.20 shows food consumption as an obvious priority, with children's education, payment of long-term debts and purchase of a radio appearing as important. Improvements in the house and the purchase of household items came next. Seventy-six percent also increased their savings. When asked about the source of the means for increased consumption, farm income was predominantly mentioned but one cannot ignore a good number of farmers who traced their improved purchasing power to a combination of farm and off-farm income. It seems so evident that given the income, farmers know what they want to do with it. The basic necessities get prior attention. Where fewer farmers report increase in rice profits, the accompanying amenities are also less, as illustrated in Table 4.21 where Davao del Sur has lower proportion of farmers experiencing increase in rice profits, level of living, and purchase of household and farm items.

Table 4.20. Rice farm households' increase in consumption items from 1965 to 1970 and source of income for it (193 farmers of Gapan, Nueva Ecija.)

Consumption Items (Gapan, Nueva Ecija)			*Households reporting increased consumption or purchase of items and their sources of income for it*		
	Number reporting	*Percent of total reporting increase*	*Farm income*	*Off-farm income*	*Combination of the two*
			Number reporting		
1. Food consumption Total N = 193					
Rice	141	73	87	2	52
Vegetables	142	73	87	2	53
Fish	139	72	85	2	52
Eggs	140	72	85	2	53
Chicken	140	72	85	2	53
Pork	124	64	78	2	44
Beef	97	50	57	2	38
Canned goods	112	58	68	2	42
Milk	127	64	77	2	48
Coffee	127	64	76	2	49
Cooking oil	136	70	82	2	52
2. Children's education	107	55	67	2	38

Table 4.20 (Continuation)

	Consumption items (Gapan, Nueva Ecija)		Households reporting increased consumption or purchase of items and their sources of income for it		
	Number reporting	Percent of total reporting increase	Farm income	Off-farm income	Combination of the two
			Number reporting		
3. House improvement or new house built	99	51	59	6	34
4. Radio	120	62	75	12	33
5. Sewing machine	56	29	35	2	19
6. Living room set	70	36	42	6	22
7. Dining room set	47	24	27	3	17
8. Clothes cabinet	92	48	54	6	32
9. Gas or electric stove	34	18	25	3	6
10. Bed	16	8	11	2	3
11. Bicycle	16	8	8	–	8
12. Motorcycle or motor scooter	18	9	11	–	7
13. Bought tractor or other farm implement	41	21	24	–	17
14. Increased savings	76	39	47	1	28
15. Paid off any long-term debts	119	62	80	2	37
16. Started new farm enterprise	10	5	7	–	3

Source: R. T. Herrera, *op. cit.*

Table 4.21. Percent of farm households reporting increase in level of living and consumption items from 1967 to 1970

	Baybay, Leyte			Hagonoy, Davao del Sur	
	Canipa	Marcos	Tab-ang	Sinayawan	Beinte Nueve
N =	49	66	56	95	66
		–Percent–			
1. Rice profits	55	38	45	24	32
2. Level of living		No data		20	35
3. Food consumption	61	48	47	51	38
4. Educ. expenditures	41	33	39	27	23
5. House improvements	45	62	45	12	30
6. Savings	2	–	9	10	9

Table 4.21 (Continuation)

	Baybay, Leyte			*Hagonoy, Davao del Sur*	
	Canipa	*Marcos*	*Tab-ang*	*Sinayawan*	*Beinte Nueve*
7. Reduction of indebtedness	49	53	70	No data	
8. Household furniture (includes appliances)	45	35	38	8	23
9. Household appliances	–	–	–	41	41
10. Tractor	–	1	2	9	6
11. Farm tools and equipment	57	51	21	19	2
12. Other farm enterprises	2	2	2	3	6
13. Bicycle	8	–	–	19	19
14. Motorcycle or scooter	–	–	–	1	4

Source: Stewart, *op. cit.* T. E. Contado and Jaime, *op. cit.*

The case of Baybay, Leyte is also interesting. Barrio Canipa which had the highest percentage of farmers reporting increased rice profits was a rainfed barrio until 1967 when a private irrigation pump was installed and farmers paid a fee for the water. The new rice varieties and the pump irrigation made double-cropping profits between 1967 and 1970. Compared with those of Baybay and Hagonoy, Gapan farmers seemed to have gained most, relative to how they were before HYV. This is understandable because Gapan has more of the institutional infrastructure, being a pilot and reform area.

SUMMARY

When the Filipino rice farmer adopted the new rice technology, a modernizing outlook in agriculture, new attitudes, aspirations, perceptions and amenities in life came along and so did some undesirable experiences. This chapter described the nature of these changes on the basis of the empirical evidences available. The most dramatic but unanticipated change (if one were to go by the social scientists' pessimistic prognostications) is the farmer's enthusiastic response to the new technology and its accompanying package. This development has just about ended the era of the traditionally self-sufficient farmer who grew his rice crop on his own, using his family labor, his seeds, his carabao, his plow, etc. Now, he has to establish links with the outside world for his seeds, inputs, credit,

market, farm equipment, irrigation services, technical advice, and other elements considered essential or incidental to modern agriculture. From all indications, the Filipino rice farmer is *not* resisting these changes. Willingness to take risks in the interest of larger returns has likewise been very evident. A few attempts to "compel" adoption behavior among the reluctant has also led to positive attitudes arising from rewarding results in terms of production. So far, even adverse experiences with the new technology have not resulted in a reversal to the old seeds except that in some cases, a pattern of risk avoidance is resorted to by reducing inputs.

A progressive farmer has been redefined as one who does not avoid indebtedness but one who borrows for productive purposes. Credit is now his battle cry. With the greater production potential offered by new technology, an experimental outlook has emerged side by side with a more vigorous work ethic geared to increasing productivity. However, these new opportunities to get ahead in life tend to be disequalizing in the sense that farmers no longer need to be equally poor. For reasons of differentials in resources or responsiveness, there are those who are more able than others to take advantage of these opportunities. Despite this, even farmers who are relatively disadvantaged compared with others consider themselves better-off relative to how they were before.

Rising levels of aspiration and expectations with respect to productivity and the "good life" are accompanied by greater demand for infrastructure and other agricultural services. The farmer's definition of his problems and his prospects for the future lie in the application of what he views as promising new technology and the modifications in the institutional and infrastructural framework. However, the increasing modernization in rice farming has not persuaded farmers that children ought to follow their footsteps. Educational and occupational aspirations remain very much away from farming even if they know that chances of fulfillment are rather slim. It is also obvious that many rice farmers are in rice farming for negative rather than positive reasons because for them there are no alternative ways of making a living. In the midst of all the innovativeness manifested not only in attitudinal but in behavioral terms, there is a residual of *fatalism-good-luck-bad-luck* syndrome and man's fate continues to be placed in the hands of God. This is interpreted as a reflection of the reality that rice farming in the

Philippine is very much subject to the whims of nature, scientific technology notwithstanding.

Although more contractual relationships are emerging, the farm business is far from being the "business" which economists dream of. Farmers' assessments of rice profits and level of living have been directly associated with the benefits of the new technology rather than with any other factor. Even in areas where land reform has been vigorously pursued, the change in tenurial status has hardly been mentioned as a contributory factor to increased rice profits or improved level of living. It is possible that from the farmer's point of view, the shift from share tenancy to leasehold or to owner-operatorship is valued as a source of durable security and only incidentally as an instrument or an incentive to increased productivity. Consumption and enjoyment of life's material amenities go with the fortunes of good harvest just as a poor harvest means deprivation.

5
Employment and Income Distribution Aspects of the New Rice Technology

Many years ago, the world of international development expertise was preoccupied mainly with the problem of increasing productivity and of winning the race between food and population. The development of technology to cope with this crisis was therefore of top priority although there were doubts expressed then as to how traditional subsistence-oriented farmers would respond to these efforts toward modernization. Now, more than 10 years after and some "breakthroughs" (major, minor or minimal, depending upon who is assessing it), we expect such technology not only to solve the food problem but also to reduce inequalities and to generate employment or at least, not to worsen the status quo while at the same time produce food for the exploding population. If the new rice technology could accomplish growth, income distribution and employment simultaneously, it would indeed make green revolution watchers happy. It might also be the greatest miracle of all times.

In order to assess the employment and income distribution implications of the new rice technology, this chapter examines trends in mechanization and adoption of recommended farm practices, changes in farming status and farm labor patterns, and the role of off-farm and non-farm employment. Studies on farm size, labor input, yield and income levels associated with the new rice technology are also reviewed in regard to the income distribution question and the manpower dilemma in rice production is presented.

A. Trends in Mechanization and Adoption of Recommended Production Practices

1. *Tractorization*

A long time ago, man designed machines and other equipment in order to lighten the human burden while promoting efficiency and

effectiveness in getting things done. At present, the fear with respect to the developing countries is the labor-displacing effect of such machines. In some ways, the societal gains from non-mechanization are in conflict with the private rationale for it. The chances that a farmer will opt for a labor-absorbing technique in the interest of promoting ILO's World Employment Program are probably very slim. Rather, he would do so for his own reasons defined within his environment and socio-cultural institutional framework. It would, therefore, be a boon if the effects of his choices contribute to employment creation. When one has seen the back-breaking work involved in rice production (which has been romanticized in the Philippine folksong "Planting rice is never fun, bent from morn till the set of sun"), at the individual farm and farmer level, the twin demands for liberation from sweat and toil and for labor absorption create a disturbing dilemma on the part of those who have to live with it. Since the tractor is the most "in" symbol of mechanized and often presumed to be "progressive" Western agriculture, its introduction and the consequences of its adoption are currently of great concern. Before it is dismissed as a social evil for displacing labor, we have to understand at least some of the circumstances surrounding its adoption.

In 1965, when hand tractors were beginning to appear more frequently in the rice paddies, a study revealed the reasons for purchasing these machines. Table 5.1 shows clearly that peace and order and physical problems involved in caring for the carabao was as important, if not more so, than the desire for greater efficiency and additional economic returns. In the three municipalities studied in Laguna,[1] there was one tractor in 1959; 4 in 1960 and 6 in 1961. Then, there was a rapid increase to 50 in 1962, 58 in 1963 and 68 in 1964. By 1965-66, each farmer in the sample studied owned a tractor and the following year, 50 percent of these farmers had acquired two or more. The desirability of owning this piece of machinery may be gauged from the fact that 88, or 44 percent, of the total tractor purchases in 1964-65 among the farmer-respondents, were on a cash basis. About 98 percent of these cash purchases came from savings and crop sales. One sold a carabao and another sold land to buy the tractor. The rest of the purchases were done by installment with down payment coming mostly from crop sales, then savings and

[1]Nelly G. Alviar, A Study of Tractor and Carabao Cultivated Farms in Laguna. Paper prepared for the Seminar on Economics of Rice Production, IRRI, December 11-13, 1969.

Table 5.1. Reasons for buying hand tractors, 150 Laguna farmers, 1965.

Reason	*Percent of total respondents giving reason*
1. Difficulty in the care of the carabao: carabaos are stolen, poisoned, need care and feeding	60
2. Saves time in land preparation: works faster, easier, cheaper, can work continuously	44
3. Affects the depth of paddy. The paddy becomes shallower with use of hand tractors over time	24
4. Purchased primarily for own use	21
5. Purchased as a source of income by renting out	19
6. Suggested and financed by landlord	4
7. To ease the work of the carabao	3

Source: R. Barker, S. S. Johnson, N. Alviar, and N. Orcino, Comparative Economic Analysis of Farm Data on the Use of Carabao and Tractors in Lowland Rice Farming. Paper prepared for Farm Management Seminar With Focus on Mechanization, Manila, Feb. 24 to March 1, 1969.

two from carabao sales. Loans were obtained mainly from the landlord, the rural bank, relatives, friends and private moneylenders. The installment payments came from crop sales. Doubtless, the investments in these tractors were not inconsequential.

The number of tractors per farm increased from 1.25 for 1964-65 to 1.44 for 1965-66 to 1.66 for 1966-67. The purchase price per tractor went up from ₱2,544 to ₱2,935 to ₱3,225; the average horsepower also went up from 4.6 to 4.8 to 5.0. Of greater significance is the fact that during the first year of the survey, there was some sharing of tractor purchase. In the second year, each farmer owned at least one tractor, and by the third year, 50 percent of the operators owned two or more.

Comparing the characteristics of carabao-operated and tractor-operated farms, Alviar found the latter twice (4.8 ha.) as large as the former (2.3 ha.). The tractor-operated farms were almost 100 percent double-cropped, while the carabao-operated ones were only about 62 percent. In terms of status tenure, 97 percent of carabao farms were operated by the tenants, while tractors farms had only 81 percent operated by tenants. The total man-days per hectare was 77 for the former and 74 for the latter. For plowing and harrowing, the number of man-days were 20 and 13, respectively. This shows a

difference of 7 man-days attributable to tractor use. According to Alviar, the economics of tractor use shows that a custom rate of ₱120 per hectare with 12 percent interest and a 7-year life, a tractor breaks even if used in an effective crop area of about 12 hectares. If a farmer has only a crop area of 5 hectares, it is not advisable for him to buy a tractor unless he rents it out and serves 10 hectares or more. Assuming that it takes 21 days at ₱8 a day for a carabao to plow and harrow a hectare, then a carabao can work on about 10 hectares a year at ₱164 a hectare. It costs less to use a tractor for land preparation provided it is kept as fully occupied as possible. But such does not seem to be the case. Data from Laguna for 1964-69 show a decreasing trend in number of hours used per year, from a total of 523 hours in 1964-65 to 345 in 1968-69 (Table 5.2). The decline in use was both for on-farm and off-farm although proportionately speaking, the total hours devoted to off-farm use remained almost the same — more than 40 percent. Majority of the tractors were used for less than 500 hours and were serving less than 10 hectares. Under such circumstances, tractor use was already uneconomic based on earlier calculations. This reduction in area and the reluctance of owners to hire them out because they claimed that repair and maintenance costs were often higher than income derived from tractor hire. Despite this seeming uneconomic investment in the hand tractor, why do the farmers purchase tractors at such high costs?

Table 5.2. Average number of hours used per tractor per crop year, Laguna, 1964-1969.

Crop-year	Hours used per year			
	On-farm	*Off-farm*	*Percent of total*	*Total*
1964-65	376.8	146.4	28	523.2
1965-66	252.8	236.8	48	289.6
1966-67	232.8	216.0	48	448.8
1967-68	224.0	168.8	43	392.8
1968-69	188.0	156.8	46	344.8

Source: Nelly G. Alviar, *op. cit.*

As Alviar explains it, timeliness is an important aspect of tractor use, the costs and gains from which are not easy to

compute directly. Timeliness has reference to the need to accomplish land preparation within a much shorter period due to double-cropping in a year or 5 crops in two years made possible by the introduction of early-maturing varieties. It is also related to seasonal labor shortages where crops like coconut or sugar cane compete for available labor during the peak seasons.

Some other cultural and institutional factors must be involved in tractor use; different parts of the country differ in patterns. In a Leyte study, only 2 percent of 171 farmer-respondents used the hand tractor. Although there was 100 percent double-cropping, the average cultivated rice field was less than one hectare.[2] In Davao del Sur, almost 90 percent of the farmers were using 2-wheel tractors[3] while in Gapan, Nueva Ecija, 4-wheel tractors were used – 100 percent in the well-irrigated village, 83 percent in the poorly irrigated and only 42 percent in the rainfed village.[4] Laguna uses practically no 4-wheel tractors, only hand tractors. In Davao, Cotabato and Gapan, the practice of custom-hiring tractors is much more prevalent then in Laguna where hand tractor ownership is more common. Of course, it is reasonable to expect a higher percentage of hand-tractor than 4-wheel tractor ownership considering the sizeable cost of the latter. Farm size is not an adequate explanation for the differences because the average size of tractor-operated farms is even larger (4.8 hectares) in Laguna than in Gapan (3 hectares) where 4-wheel tractors are in greater use.

For added insights into the farm level impact of hand tractors, it would be worthwhile to see the seven-year experience in a rural development area in villages in Laguna. The first tractor in the place was acquired in 1963. At the end of that year, there were only about 5 tractors operated for hire. As of 1970, there were 100 tractors in the area owned mostly by tenant farmers. The prevailing rate then for land preparation on a contract basis was ₱150 per hectare. The work involved preparing the land until it was ready for transplanting. On a daily basis, the fee was ₱30. Under both arrangements, the person hiring had to provide breakfast, lunch and two snacks. If the tractor was hired without the operator, the fee was ₱17 per day. In this case, the farmer had to hire two operators at ₱4.00 per day. The 1970 cost of one tractor was ₱6,000 and most of the owners bought

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[2]T. E. Contado and R. A. Jaime, *op. cit.*

[3]James C. Stewart, *op. cit.*

[4]R. T. Herrera, *op. cit.*

it on an installment basis. Under this arrangement, there was a down payment of ₱700 and ₱700 was paid every six months thereafter for a period of six years.

A general consciousness of the sizeable investment in the tractor and in other new prices of equipment and their depreciation have led to new norms governing their use. A more business-like relationship is emerging. When asked if tractors are borrowed under the traditional mutual exchange of labor, farmers smiled and said: "Only if one's own tractor breaks down is there an attempt to borrow someone else's." The tacit understanding is that at some future date the other party will reciprocate. This implies that if a farmer does not have a tractor, he has no basis for the exchange.

A definite hiring price for tractor use, either in cash or in kind, has become customary. In the case of sprayers, they can be borrowed for free by a friend, relative, compadre or neighbor only once or at the most twice. Lender and borrower alike understand the potentially disastrous effects for both parties if the application of insecticides and rodenticides is misunderstood or mishandled. The near effect of all this has been for farmers to want to purchase their own equipment or to rent for a fee, so they can use it regularly without embarrassment.[5]

Besides the use of hand tractors for plowing and harrowing they double as a means of transportation. During the off-season months, they are used for hauling passengers and rice from the village to the town. As of 1970, in one village, 11 Kubota hand tractors with improvised trailers attached to them had been the only means of transportation since 1966. A total of 10 to 12 persons can be accommodated at one time. Kubota owners charge a fare of ₱0.25 per person or ₱0.30 per cavan of unhulled rice from the village to the town. The net earnings from this other function of the hand tractor are used to pay the installments on the tractor or to repay loans. To service all these vehicles, including hand tractors, jeepneys and tricycles in the area, a Caltex gasoline station was installed in 1968.

2. *Credit and Tractorization*

At the national level, Barker relates the growth of tractorization

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[5]Felix M. Eslava, Jr. The Sprayer That Was Nearly Rejected: A Case Study prepared for a graduate course in Social and Cultural Change. University of the Philippines, College of Agriculture, 1969.

in the Philippines to shifts in government policy. From 1959 to 1962, tractor importation was discouraged by the effect of the peso devaluation while the rise in tractor sales from 1962 to 1964 was related to expansion of sugar-cane area due to increase in sugar prices. Then, the Central Bank of the Philippines negotiated two loans with the International Bank for Reconstruction and Development to promote farm mechanization. An initial loan of $5 million for the period from April 1, 1966 to May 31, 1968 resulted in a sharp increase in tractor sales (Table 5.3). In February 1970, the de-facto devaluation of the peso brought a sharp decline in tractor sales despite the second CB:IBRD loan worth $12.5 million for the period from September 1, 1969 to March 31, 1973.[6] Though the CB:IBRD loans partly explain the increase in tractor sales, it is far from being an adequate explanation. An examination of tractor sales and loan releases in Table 5.4 clearly indicates that CB:IBRD loans account for only a portion of tractor sales. For example, in 1967 only, 36 percent of tractors and 24 percent of power tillers sold were financed from these loans. For 1968 only, 16 percent of tractor sales and more than 12 percent of power tiller sales came from CB:IBRD loan releases. The situation in 1969 was even more dramatic because

Table 5.3. Imports of tractors and sales of power tillers in the Philippines, 1958-1970.

Year	*Four-wheel Tractor imports*	*Power tiller sales*
1958	735	n.a.
1959	572	n.a.
1960	297	)
1961	102	) 1505 estimated
1962	262	) cumulative total
1963	918	) of power tillers
1964	859	) sold between
1965	769	) 1960 and 1965
1966	518	
1967	2203	
1968	1443	
1969	1390	
1970	764	

Source: Randolph Barker, *et al.*, Employment and Mechanization in the Philippine Agriculture (Paper prepared for ILO, Oct. 1971).

Original data were obtained from the Bureau of Census and Statistics and Agricultural Machinery Dealers Association, Manila.

[6]Randolph Barker, Labor Absorption in Philippine Agriculture. Paper prepared for the Workshop on Manpower and Human Resources. Los Baños, Laguna, October 13-15, 1972.

there were only 54 and 34 loan releases but tractor sales were 1358 and power tillers sold were 910. The floating rate in 1970 neither explains the increase in tractor imports from 982 in 1970 to 1065 in 1971 and increase in sales from 987 to 1086, although there was a decline in power tiller sales from 475 in 1970 to 258 in 1971.

Another evidence which mitigates the role of the CB:IBRD loans in the increasing tractorization is the fact that the total withdrawals from the IBRD loan was ₱19,531,225.76 as of March 1972. The total amount available was $5 million or at least ₱30 million equivalent. For the second CB:IBRD Credit Program covering the quarter ending March 31, 1972, the total withdrawals amounted to only ₱18 million, while the total amount available was ₱80 million up to March 31, 1973. This means that the loans were only partially utilized even when tractors and power tillers were purchased. There is a strong suggestion that financing came from elsewhere and the IBRD loan could hardly be held as total sources of the tractor purchases.

Since the CB:IBRD loan program offers only a very partial explanation for the increase in tractor sales, what else could explain this development? Again, an examination of tractor import and sales figures in Table 5.4 reveals the spurts in 1967-1969. This coincides

Table 5.4 Annual sales of power units and number of mechanization loans released under CB:IBRD credit program.

Year	*Total imports*	*Total sales*	*Inventory*	*Total power tillers*	*Sales*	*No. of loans released for tractors*	*tillers*
1960	297						
1961	102	813	(711)				
1962	262	994	(732)			(Estimated	
1963	918	863	55			cumulative	
1964	859	950	(91)			total of power	
1965	769	607	162	1505		tillers sold	
						1960-65)	
1966	518	664	(146)	1932		72	126
1967	2203	1531	672	3058		560	724
1968	1443	1630	(187)	1873		265	228
1969	1390	1358	(32)	910		54	34
1970	982	978	4	475		150	42
1971	1065	1086	21	258	(Jan.-May)	251	109

Source: IRRI Dept. of Agricultural Engineering Economic Research 1973. Data were from the Bureau of the Census and Statistics and Agricultural Machinery Dealers Association, Radiowealth, Inc.

with the sugar boom as well as with the advent of HYV's and the intensification of the rice production drive. One could, therefore, speculate that these two developments could have encouraged the agricultural machinery dealers to meet an anticipated demand for their wares. Probably the existing government policy at that time was not such as to dampen this enthusiasm.

What should be of equal if not greater concern is not just tractorization but the tendency for loans to be used for purchasing big tractors rather than power tillers. Forty-five percent of the CB:IBRD loan releases which make up 69.2 percent of the total amount released for the period 1966-1971 went to 4-wheel tractors and only 18.3 percent of the releases making up 6-9 percent of the total amount released went to power tillers. Furthermore, 63.7 percent of the loan releases went to Luzon; 21.0 percent to Visayas and 15.3 percent to Mindanao. Sixty-seven percent of the total amount of loan releases went to Luzon; 22.6 percent to Visayas and 10.3 percent to Mindanao. Therefore, as far as the CB:IBRD loans are concerned, they have gone mostly for large tractors with greater concentration in Luzon than in the Visayas and Mindanao. Considering that rice lands are more predominant than sugar in Luzon, one might infer that these tractors are being harnessed for rice production. Farm level studies would substantiate this inference because of the popular use of tractors for land preparation in Central Luzon.

Although we know the trends at the aggregate level, farm level studies will give us information on tractor use and ownership. An IRRI survey of 142 respondents from among a population of 500 tractor owners in a high tractor density area in Nueva Ecija provides a picture of the local situation (Table 5.5). Supportive of the aggregate findings is the prevalence of the heavy over the light machines, with newer tractors having almost twice as much horsepower as the older one and naturally at a much higher cost. Eighty-eight percent of the tractor owners are farmers, almost all of whom are owner-operators who cultivate an average area of 28 hectares. It is significant that 78 percent of the farmer tractor owners use their machines also for custom service besides the ten non-farm full-time custom service operators. The latter travel as far as 500 kilometers in search of work for their tractors. They move from one area to another according to the cropping pattern in the area. Although the data indicate heavier tractors in the irrigated areas, 40 percent of the light machines are located on the rainfed land. Considering that the area being

Table 5.5. Tractor ownership patterns and tractor characteristics, Nueva Ecija, 1972.

	Horsepower class			
	Light 50 HP N = *15*	*Medium 50-65 HP* *59*	*Heavy 65 +* HP *68*	All *classes*
Owner	14 (57%)[1]	49 (73%)	62 (87%)	125 (78%)
Owner-operator	14	48	61	123
Tenant	–	1	–	1
Lessee	–	–	1	1
Custom service operator	–	4	6	10
Landlord	1	6	–	7
Farm characteristics				
Ave. size in ha.	36	24	29	28
Area double-cropped	39	39	43	41
Irrigation (%)				
Rain	40	27	22	26
Canal	44	52	57	54
Pump	16	21	21	20
Employment	6	3	6	5
Farm laborers	4	1	3	2
Tractors drivers	2	2	3	3

[1] percent doing custom work.

Table 5.5 (Continuation)

	Horsepower class			
	Light 50HP N=15	*Medium 50-65HP 59*	*65+HP 68*	*All classes*
	Tractor characteristics			
Ave. age	9.3	4.3	3.4	4.4
Ave. HP	38.7	58.1	72.0	62.5
Purchase price	₱2,807.7	₱29,882.8	₱47,834.8	₱35,547.5
Acquisition				
Cash	6 (40%)	9 (15%)	7 (10%)	22 (15%)
Installment	9 (60%)	50 (85%)	61 (90%)	120 (85%)
Financing				
IBRD	3 (33%)	34 (68%)	50 (82%)	87 (73%)
Dealer	2 (22%)	11 (22%)	6 (10%)	20 (17%)
DBP	3 (33%)	2 (4%)	5 (8%)	10 (8%)
PNB	1 (11%)	1 (2%)	–	2 (1%)
Others	–	2 (4%)	–	2 (1%)
Tractor Use Patterns				
Ave. annual use (months)	7.86	5.06	5.90	5.69
Location and season				
Wet season (days)				
Own Farm	22.25 (31%)	14.17 (25%)	16.0 (24%)	15.26 (25%)
Off-farm	48.42 (69%)	42.81 (75%)	50.0 (76%)	46.36 (75%)

Table 5.5 (Continuation)

	Horsepower class			
	Light 50HP N=15	*Medium 50-65HP 59*	*Heavy 65+HP 68*	*All classes*
Farm implements owned	12 (80%)	39 (57%)	39 (57%)	90 (65%)
Disc plow	4 (27%)	21 (36%)	50 (74%)	75 (53%)
Rotavator	3 (20%)	26 (44%)	13 (19%)	42 (30%)
Ara-wheel	4 (27%)	9 (15%)	15 (22%)	28 (20%)
Disc harrow	–	8 (14%)	3 (4%)	11 (8%)
Pigtooth harrow	–	10 (17%)	14 (20%)	24 (17%)
Thresher				
Dry season (days)				
Own farm	18.91 (28%)	8.60 (15%)	9.4 (13%)	10.4 (16%)
Off-farm	49.30 (72%)	49.28 (85%)	63.18 (87%)	56.27 (84%)
Percent utilization by operation				
Rotavator	27	24	56	38
Plow/harrow	73	25	23	29
Ara-wheel	–	30	15	20
Thresher	–	21	6	13

Source: IRRI Department of Agricultural Engineering, Economic Research, 1973.

double-cropped is only about 50 percent, demands on power for double-cropping cannot be a thoroughly convincing argument for the degree of tractorization which has occurred. Just as expected, the average number of persons employed by tractors is only 5 (including 2 farm laborers and 3 tractor drivers).

The average capital expenditure was ₱35,547 for each machine. Further suggestion of possible economic irrationality in tractor acquisition is the relatively low level of utilization which averages only about less than 6 months, with the lighter machines enjoying longer use than the medium (5 months) and the heavy (5.9 months) ones. Only 25 percent of the tractor's working days are spent on their own farms during the wet season and 16 percent during the dry season. The rest of the days are on off-farm work. The IRRI study also points out that most tractor owners buy pieces of equipment which they seldom use. For example, 65 percent of them have disc plows but only 29 percent use the tractor for plowing. The rotavator is supposed to be more effective for tillage under wetland conditions. In the case of the harrow, although 20 percent of them own it, majority of the farmers still maintain carabaos to do the harrowing.

Aggregate figures on tractors sales and CB:IBRD loan releases show that 73 percent of the tractors were financed from these loans. Understandably, only 15 percent bought on a cash basis and 85 percent did so on installment. Incidentally, the March 1972 Progress Report on the CB:IBRD Farm Mechanization Program registered ₱19,531,225 as total amount released but loans outstanding as of March 31, 1972 totaled ₱13,797,596 and loans past due the same date, ₱4,866,144. Considering what appears to be less than economically rational aspects of tractor purchase, one wonders how much of these loans could actually be repaid from proceeds of tractor use either on-farm or off-farm. The role of the agricultural machinery dealer in the choices made by the farmers cannot be ignored and perhaps needs to be paid attention to as much as government policy on credit and mechanization.

3. *The Adoption of Recommended Practices*

To raise productivity levels, a package of practices was developed to accompany the new seed. The latter was never meant to be a single ingredient. However, the adoption of these cultural practices has been a source of apprehension among employment experts because of their potential labor-displacing effects. What is often forgotten in the wake of such fears is that rice production in

the past had been mostly a plow-plant-and-wait-for-the-harvest process with not much care being given to the rice plant. For example, the introduction of herbicides is considered labor-reducing. Actually, weeding operations by whatever method absorbs labor especially when one considers that there was little or no weeding being done before. Of course, some methods require more labor than others but which farmer would opt for a more expensive choice if institutional, technological and wage factors prevailing in a particular locale dictate otherwise? An IRRI study on weeding practices in 1966 and 1970 illustrates precisely this point (Table 5.6). In Laguna, for example, there are no nonweeders and nobody used *chemicals only* as of 1970. Instead, they used a combination of hand, rotary weeder and chemicals. Straight-row planting is practiced everywhere in Laguna although some of the transplanting is not done in two-way straight rows. The local custom of giving weeders the option to

Table 5.6 Method of weeding used by 153 farmers in Laguna survey and by 76 farmers in Central-Luzon surveys, 1966 and 1970, wet season.

	Laguna				*Central Luzon-Laguna*			
	1966		*1970*		*1966*		*1970*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Chemical only (1)	39	25	0	0	3	4	2	3
Hand only (2)	12	8	1	1	40	53	28	37
Rotary weeder only (3)	9	6	2	1	3	4	0	0
(1) + (2)	38	25	23	15	7	9	21	28
(1) + (3)	34	22	17	11	0	0	1	1
(2) + (3)	1	1	4	3	1	1	5	7
(1) + (2) + (3)	20	13	106	69	3	4	7	9
No weeding	0	0	0	0	19	25	12	16
Total	153	100	153	100	76	100	76	100

Source: Ricardo A. Guino and Wm. H. Meyers, The Effect of the New Rice Technology on Farm Employment and Mechanization. IRRI, Saturday Seminar, December 4, 1971.

harvest has minimized the use of herbicides and reinforced the ongoing practice of straight-row planting and rotary weeder. An economic calculation of this custom would yield an unfavorable balance for the farmer compared to the harvester, but this is a social device for sharing the harvest with the other members of the community – a redistribution of "wealth" in a way. But the age-old practice of having neighbors and relatives perform the weeding operations in the field so that they also have the privilege of

harvesting the same field is coming under scrutiny. The farmer now sees the advantages of specifically hiring labor to perform the weeding so he could obtain timely, effective and better-supervised services. Under the traditional arrangement, the farmer is somehow constrained by long-standing personal relationship from demanding a new quality of work. Actually, the system of paying in rice rather than in cash has also been found to be expensive, for there is a custom of measuring the harvester's share in more tightly packed cans than the farmer's share. Hiring labor to perform weeding, however, means more cash outlay which is hard to obtain.[7]

An IRRI analysis concluded that the economic advantage of using herbicides compared with hand weeding is principally decided by the cost of the labor for hand weeding and the amount of labor saved by substituting herbicides for hand weeding. If the cost of herbicide is ₱70 per hectare and if labor is hired for weeding at ₱3.50 per day, then it would be more profitable to use the herbicide than to hire 175 hours or more of labor to do the job. (Table 5.7). However, if only 125 hours are used for hand weeding it would pay to continue hand weeding. If the price of herbicide falls to ₱30 per hectare and the wage rate remains the same, it now pays to use herbicide when the labor saved by hand weeding is comparatively small. The drop in herbicide price from ₱70 to ₱30 is likely to have an impact on increased use of herbicides.[8]

These estimates, however, assume that hired labor for weeding is available when needed and that the farmer has the cash to pay for

Table 5.7. Cost per hectare of hand weeding at different weeding intensities and farm wage rates.

Daily farm wage rate	*Cost of weeding (₱/ha) Hours for hand weeding*			
₱	*75*	*125*	*175*	*225*
2	19	31	44	56
3	28	47	66	84
4	38	62	88	112

Source: Department of Agricultural Economics, Annual Report, 1969, IRRI.

[7]G. T. Castillo, The New Rice Technology and Patterns of Rural Life in the Philippines, *Rice Science, and Man.* IRRI, Los Baños, Philippines, 1972.

[8]Department of Agricultural Economics Annual Report, 1969, IRRI.

it. Furthermore, it does not take into account the customary weeding-harvesting option practiced in certain localities which acts as social pressure against herbicides. Another assumption in the computation is that farmers would apply the recommended amount of herbicides. Actually, the Gapan farmers who are predominantly herbicide users apply only minimal amounts. One look at their rice fields tells us that the weeds only "smell" the herbicides and are not about to die from it. Again, effective use of these chemicals requires sufficient dosages applied at appropriate times. This needs more capital and more labor, both of which are expensive, hence the farmer (or his family members) performs the herbicide operation himself using minimal amounts. This saves capital and labor but does little to stop the weeds. A similar situation exists in Davao del Sur where practically everyone uses herbicides. Leyte is more like Laguna in favoring straight-row planting and rotary weeding. The weeding-harvesting option is practiced there too (Table 5.8).

In the same table, both the Gapan and Leyte villages definitely show increase in the proportion of farmers using chemicals, fertilizer, insecticides, and weeding devices. In Davao del Sur, the downward trend in fertilizer use and straight-row planting is explained by Stewart as risk-avoidance and lack of capital due to successive crop failures. Landlords in this area do not assume any share in the production costs because the sharing system is such that one-third of the produce goes to the landlords and two-thirds to the tenant.[9] These cultural practices which accompany the new seeds are by nature labor absorbing. Unlike the traditional varieties whose care was left mainly in the hands of God, the new ones perform best when lavished with "tender, loving care" so to speak. As a matter of fact, one of the most important changes brought along by the new seeds was the tendency to adopt more of the package practices than they did before. The mere adoption of practices which were not used before is already an important change. The next step is to intensify or improve the manner with which such methods are pursued. This means more timely and more thorough weeding, more timely and more appropriate insect control measures, etc. Again, all these require even higher labor inputs and therefore at this point, the farmer begins to look for labor-saving measures. Who wouldn't?

Another practice which is a favorite of back-to-nature advocates is the use of organic fertilizer. In Table 5.8, one can see that

[9] J. C. Stewart, *op. cit.*

Table 5.8. Changes in farming practices in Gapan, Leyte and Davao del Sur Villages.

Practices adopted	Gapan						Leyte						Davao del Sur			
	Mahipon		Malimba		San Nicolas		Canipa		Marcos		Tab-ang		Sinayawan		Beinte Nueve	
	Pre HYV	1971	Pre HYV	1971	Pre HYV	1971	Pre HYV	1971	Pre HYV	1971	Pre HYV	1971	1967	1972	1967	1972
	—PERCENT—															
1. Use of organic fertilizer	97	93	30	7	18	0	0	0	3	0	2	0	2	1	2	3
2. Use of chemical fertilizer	94	100	58	100	73	100	21	88	68	98	66	98	89	41	83	39
3. Use of insecticide	79	100	58	97	69	100	21	94	66	98	97	98	99	100	100	100
4. Use of sprayer	86	99	65	90	75	100	0	23	0	14	0	34	99	99	92	92
5. Use of herbicide	25	44	33	58	67	93	3	16	4	5	2	21	97	95	99	99
6. Use of straight-row planting	1	13	6	5	5	0	39	98	79	100	83	98	36	17	62	18
7. Use of mechanical weeder	0	6	8	23	9	7	34	98	79	98	83	98	0	0	0	0
8. Irrigation by pump	7	17	15	36	7	25	35	86	0	0	0	0	0	0	0	0

Sources: R. T. Herrera, *op cit.*, T. E. Contado and Jaime, *op. cit.* and J. Stewart, *op. cit.*

in Leyte and Davao del Sur hardly anyone used it. In Gapan, some farmers from Malimba and San Nicolas adopted the practice before HYV but by 1971, it had been dropped. Mahipon, the rainfed village, continued on with 93 percent of the farmers and despite the fact that all of them use chemical fertilizer. For them it's not an either-or but a combination of both. What accounts for this exceptional behavior of Mahipon farmers? Herrera attributed the use of organic fertilizer, especially carabao manure, to the following factors:

"(a) Hauling of organic fertilizer is not much of a problem as the farmers' houses are usually right on the farm;

(b) Being the farthest barrio from the town proper, it is relatively difficult to bring in chemical fertilizers considering cost, time and effort in transporting them, hence the necessity of using available organic fertilizer;

(c) As a rainfed barrio, the use of organic fertilizer involves less risk compared to chemical fertilizer since the farmer needs no capital; and

(d) Influence of a resident farm management technician who gives advice on the merits of different types of fertilizers."[10]

Another important factor which Herrera failed to mention is that the rainfed-single-crop situation leaves more time for the farmers to indulge in organic fertilizer hauling and spreading in the field. A labor-absorbing practice is, therefore, afforded.

Another interesting observation in Table 5.8 is that Leyte farmers apply insecticides but few use sprayers. They are probably utilizing systemic chemicals which are dissolved and borne through the water and, therefore, need not be sprayed. Whether this is more labor-consuming than the sprayed kind is rather unclear. Even the introduction of an irrigation pump is labor-absorbing not only because someone needs to operate and look after the pump but more because the presence of water where it did not exist before, enables farmers to adopt many of the practices they would not have been able to do otherwise. The effective applications of fertilizer, chemicals and weeding are all dependent on water.

An additional input which is seldom reckoned in the computation of man-days is the day-to-day visits which the farmer makes to his field. There is no question that more of this is being done now than five or six years ago. What this means is expressed by one farmer who said that frequent inspections of his crop give him a

[10] R. T. Herrera, *op. cit.*

chance to spot problems such as disease, weeds, lack of fertilizers, and water, and enable him to apply remedial measures immediately before the situation goes beyond repair. Barker *et al.*, for instance, found no significant difference in nitrogen input and farm size between the top and bottom yielders in the same village. However, they found distance of house from the farm a significant factor. Among the group of lowest yielders there were many cases where it required half an hour or more to walk to the field. The suggestion from these results is that given the same physical conditions, close day-to-day management of the crop conributes to better yields.[11] It is also very possible that higher production expenses stimulate more frequent field supervision in order to minimize losses from sizeable investments. It is a risk-reducing measure. Stewart likewise reports that with the adoption of HYV's additional labor has been devoted to the care of the growing plant in the form of spraying and other types of pest control, weeding and simply visiting the fields more often for inspection purposes.[12]

Table 5.9 shows a more detailed picture of the adoption pattern, extent of mechanization and relation to irrigation and use of HYV. Among the trends evident in this table are:

(1) The unirrigated barrios of Sta. Cruz, Kapalangan and Mahipon, which reported lower percentage of farms planted to HYV as of 1970, showed the highest use of mechanical threshers and lowest use of herbicides, insecticides and fertilizers.

(2) Barrio Mangino stands out in its use of straight-row planting and mechanical weeding. As mentioned previously, these practices are relatively rare in Gapan. The only explanation for their use in Mangino is that these practices were introduced by a rural reconstruction worker who was once assigned to the barrio. What is remarkable is the non-diffusion of the innovation to adjacent barrios. As pointed out earlier, Gapan farmers spend practically nothing for herbicides and do not do much mechanical weeding either. Apparently, the importance of weeding has not been effectively communicated.

(3) The pattern of tractor use is not related to percentage of adoption of HYV but rather to the quality of irrigation

[11] R. Barker *et al., op. cit.*

[12] J. Stewart, *op. cit.*

Table 5.9. Average yield, input level, and farm practices in 10 barrios of Gapan, 1970, wet season.

Barrio	Yield cavan/ ha.	Farm in HYV %	Fertilizer NKg/ha. a	Fertilizer NKg/ha. b	Insecticide ₱/ha. a	Insecticide ₱/ha. b	Herbicide ₱/ha. a	Herbicide ₱/ha. b	Tractor use Plowing % User	Tractor use Harrowing %	Mech. weeder %	Mech. weeder %	Straight row planting %	Dapog %
San Nicolas	83.9	100	73.2	73.2	7.5	7.2	3.5	2.9	50.0	3.8	15.4	7.7	7.7	0
Sto. Cristo, N.	64.8	100	64.0	62.5	9.9	9.7	3.5	2.3	14.3	2.4	11.9	2.4	7.1	4
Sto. Cristo, S.	64.8	100	63.9	63.9	9.2	8.9	3.5	2.6	40.1	0	21.9	0	3.1	0
Mangino	59.4	94.4	45.9	39.9	9.5	8.9	2.8	1.8	47.4	0	57.9	5.3	28.9	0
Baluarte	57.9	92.5	44.7	41.6	7.2	6.6	3.0	1.2	23.0	1.2	20.7	10.3	4.6	1.2
Malimba	55.0	100	48.7	45.1	5.7	5.7	3.3	1.4	26.3	0	10.5	5.3	0	0
Pambuan	54.7	91.3	57.9	57.9	7.3	6.0	3.8	1.6	29.1	0	10.4	16.7	2.1	0
Sta. Cruz	46.9	78.3	28.9	27.6	8.5	5.7	2.1	0.4	41.9	1.7	17.9	45.3	4.3	0
Kapalangan	46.0	47.8	19.2	17.5	5.6	3.7	2.8	0.5	14.5	0	9.1	70.9	0	0
Mahipon	40.6	41.3	23.4	20.0	1.9	1.0	2.4	0.1	16.7	4.2	0	79.2	0	0

[a]Average for users only.

[b]Average for all farms.

Source: R. Barker, G. Dozina, Jr. and L. Fu-shan, The Changing Pattern of Rice Production in Gapan, Nueva Ecija, 1965 to 1970. Saturday Seminar, IRRI, December 11, 1971.

Table 5. 10 Differences in labor inputs, productivity and mechanization levels between local and HYV in 1966 and 1970, wet season, Central Luzon, and Laguna.

Year/ Variety	No. of Farms	Area (ha.)	Labor input (man-days/ha)					Total	Labor		Machine users %		
			Land preparation	Pulling Trans-planting	Weeding	Other pre-harvest	Harvesting and threshing		Grain yield t/ha.	Produc-tivity kg./md.	Tractor	Weeder	Thresher
1966	76	2.4	17	15	5	8	18	64	1.9	30	14	9	62
Local			(18)	(96)	(36)	(19)	(86)	(58)					
1970	35	1.8	10	17	7	9	20	63	2.3	36	49	14	69
Local			(17)	(95)	(24)	(15)	(85)	(59)					
HYV	53	1.8	10	17	13	8	22	69	2.9	42	49	19	55
			(26)	(99)	(33)	(17)	(86)	(63)					
All	76	2.5	10	17	11	8	21	67	2.7	40	49	17	61
			(23)	(98)	(31)	(15)	(85)	(62)					

Note: Figures in parenthesis show the percent of hired labor.

Source: Ricardo A. Guino and Wm. H. Meyers, The Effect of the New Rice Technology on Farm Employment and Mechanization. IRRI Saturday Seminar, December 4, 1971.

Table 5.11. Labor input and mechanization on 76 farms in Central Luzon and Laguna Province, 1966-67 and 1970-71 crop year.

Year	No. of farms	Area of HYV Percent	Grain yield (t/ha.)	Labor-input (man-days/ha) Land preparation	Weeding	Other Pre-harvest	Harvesting and threshing	Total	Machine users % Tractor	Weeder	Thresher
					Rainfed						
1966	30	0	2.2	19	4	25	17	65	7	0	70
1970	29	74	2.5	10	9	24	22	65	48	3	83
					Irrigated one-crop						
1966	28	0	1.8	18	5	24	16	63	7	4	93
1970	24	56	2.7	9	12	25	21	67	50	17	83
					Irrigated two-crops – Wet season						
1966	18	0	1.9	13	5	19	24	61	39	17	0
1970	23	71	2.9	11	12	26	21	70	46	35	13
					Irrigated two-crops – Dry season						
1966	18	15	2.5	12	8	23	18	61	61	22	63
1970	23	88	2.6	10	13	26	22	71	74	35	74
					All farms						
1966	76	0	1.9	17	5	23	18	63	14	9	62
1970	76	67	2.7	10	11	23	21	67	49	17	61

Source: Randolph Barker, Labor Absorption in Philippine Agriculture. Paper prepared for the Workshop on Manpower and Human Resources, Los Baños, Laguna, Oct. 13-15, 1972.

The first four barrios have better irrigation.

(4) Higher fertilizer use is directly related to HYV adoption and quality of irrigation.

When total labor inputs for local varieties and HYV are compared, there is a difference of six man-days in favor of HYV, with the increase coming from weeding, harvesting and threshing, (Table 5.10). The number of farmers using mechanical threshers declined from 69 to 55 percent. The extent of tractorization remained the same for both local varieties and HYV in 1970, but showed a great increase from 14 percent in 1966 to 49 percent in 1970. The other noticeable trend is the increase in the proportion of man-days using hired labor (from 59 to 63 percent).

More than any other single factor in rice production, double-cropping has added to labor input. For example, Table 5.11. In irrigated one-crop areas 63 man-days were used in 1966 and this increased to 67 in 1970. But in irrigated two-crop areas there were 70 and 71 man-days for wet and dry seasons, respectively. There was an increase not only from 1966 to 1970 but a doubling of labor requirements in cases where farms changed from single- to double-cropping, i.e., from 67 man-days of one-crop irrigation to a total of 141 man-days for both wet and dry seasons. Increases in labor input occurred from 1966 to 1970 both in the one-crop and double-cropped irrigated areas but the addition of a second crop where there was none before meant a doubling of man-days required for the crop year.

The average yield difference in 1964-66 between rainfed and irrigated areas was about 11.12 cavans per hectare (Table 5.12). For 1968-70 this difference widened to 13.6 cavans. Despite the higher

Table 5.12. Philippine average yields per hectare by variety and irrigation, 1964-1970.

	1964-66	*1968-70*		
	Average cavans/ha	*Average*	*Local*	*HYV*
Irrigated lowland	38.59	41.54	38.54	45.40
Rainfed lowland	27.47	29.06	28.60	31.76

Source: Computed from C. Crisostomo and R. Barker, Growth in Philippine Agricultural and Rice Productivity: The Impact of the HYV's. IRRI Saturday Seminar, Nov. 27, 1971.

yield of HYV compared to local, the yield levels are very far from satisfactory considering what the potentials are. The 3-cavan difference between HYV and local for the rainfed areas is small but to rainfed farmers, it is probably a significant improvement or else, adoption of HYV's in rainfed areas would not have taken place as much as it has.

B. The Mechanical Thresher: An Antecedent to Intermediate Technology[13]

The presence of the big McCormick mechanical thresher in Gapan, Nueva Ecija is a study in itself. But whatever its social, labor and economic implications are, its introduction has nothing to do with HYV's because this machine had been commonly used in the place long before World War II. The more relevant question is: What has made it stay the way it has?

In the Gapan area, the two most common methods of threshing are the *hampas* or hand flailing and the *tilyadora* or the McCormick thresher. In the former system, the harvesting and threshing are usually done by the same person who threshes whatever he has harvested. The crop is threshed immediately after harvest and sharing is done after threshing. The arrangement is such that the harvester-threshers get 20 out of every 100 cavans or one-fifth of whatever they threshed. If cash is paid to them, the rates are ₱3.00 a day excluding meals or ₱2.50 a day including meals. The *hampas* method prevails during the wet season when the ground is soft and wet and the *tilyadora* cannot reach the fields.

In the dry season, the McCormick thresher does the job. Contrary to what one might expect from large machinery, a lot of labor is involved before the thresher could perform its operation. Harvesting is done manually with a custom wage rate of 5 cavans for every one cavan of seeds used for transplanting a particular area. This roughly means a payment of 5 cavans per hectare harvested. Such a peculiar way of determining the harvester's pay leads to an understatement of the amount of seeds used. In most cases, the crop is handled four times from harvesting to final stacking: handling during harvesting, tying into bundles, preparing of small piles and making final stacks small or big. Stacking is usually done by the farmer himself with the

[13]This section draws primarily from the studies of Lorna P. Domingo, Rice Farmers' Response to the Introduction of Intermediate Technology in the Land Reform Area of Nueva Ecija, University of the Philippines, College of Agriculture, Dec. 1972; and R. T. Herrera, *op. cit.*

mutual exchange labor from co-farmers. If stacking is hired, the cost is about 3 cavans per hectare of area harvested. The regular fee paid for the McCormick is 3 to 5 percent of the total amount threshed. All the handling operations take place during the intervening period between harvesting and threshing. The length of this time lag ranges from less than a week to three months (average almost 3 weeks), depending on when the *tilyadora* could reach and service them. An additional service usually rendered by the thresher owner is the hauling of threshed rice from the place of threshing to the farmer's house, using the truck which pulls the thresher. This is quite a saving on the part of the farmer because the usual hauling fee is ₱1.00 per cavan.

During the wet season, when many of the fields are too wet to be reached by the services of the *tilyadora*, farmers hire people to haul their harvest to the site of the machine. Most of them hire 15 to 20 people to haul a hectare's harvest in one day at ₱3.00 each or 5 people with bullcarts at ₱5.00 each. Where farmers have to wait for the *tilyadora* to come to certain specified sites, many consider it advantageous to make big haystacks of the harvested rice stalks. Among the advantages cited were: lessened movement of the *tilyadora,* thus hastening threshing; lessened spillage; less exposure to rain of rice stalks kept in big haystacks; and minimized efforts expended by *tilyadora* operators, since the rice stalks to be threshed are concentrated in a few places where big stacks are ready for threshing. Because of the size of the *tilyadora,* moving it from one place to another is quite a problem. The preparation of these big stacks is an additional expense because seven people are hired to make them. They usually ask for payment in rice or are given free lunch and snacks which cost as much as ₱20-₱30. In the interval period between the harvesting and the threshing, another process comes in, i.e., the drying. Most farmers prefer to dry the rice before threshing whether by hand flailing or by machine. But while waiting for the *tilyadora,* drying takes place anyway. More specifically, the farmers consider drying before threshing advantageous because the grains shatter easily when dry; the rice could be stored immediately after threshing; less grains remain with the straw, hence less wastage; discoloration and grain damage are minimized, thus the rice commands a better price.

All told, while the McCormick machine is an efficient thresher, the labor requirements before the actual threshing can take place are considerable. When the costs of using the *hampas* method and the

tilyadora are compared, assuming a 100-cavan yield per hectare, 20 cavans go to the harvester-thresher under the hampas method. On the other hand, the *tilyadora* costs for the 100 cavans are : 5 cavans for the harvester, 3 cavans for the piling and stacking and 5 cavans as the thresher's fee. This amounts to a total of 13 cavans, or 7 cavans less than the cost of using the manual harvester-thresher. In addition, free or discounted cost of hauling threshed rice to the farmer's house and free use of sacks and thread are further privileges which the farmers enjoy when they patronize the *tilyadora.* Roughly, this large machine is efficient in its job while at the same time absorbing much labor in pre-threshing tasks. On the part of the farmer, the cost of using the thresher is lower than that of the manual method. However, one cannot deny the high capital cost involved in the purchase of the machine. Its social cost is higher than the non-mechanized method of threshing.

Given these two extreme alternatives of physical labor and the use of a large imported machine, a search for something in-between was embarked upon. As the rationale for the program states: "Labor inputs presently constitute the largest cash cost in the production of rice. The increase in minimum wage for agricultural labor has also tended to augment the shares of total cash outlays going to labor. This creates an atmosphere within which an intermediate technology which will reduce costs or increase output and revenues becomes highly desirable. In response to this emerging need, the IRRI is developing a number of machines such as the table thresher, the row seeder and the grain cleaner which are capable of providing increased labor productivity with low investment requirements without the concomitant scale labor displacement at high operational costs." In this connection, a pilot program for the evaluation and testing of improved agricultural machinery designs in the land reform area of Nueva Ecija, was launched in 1972.

The Domingo follow-up study of farmers' responses to the table thresher provides clues to some of the problems in developing "in-between" technology.

To introduce the table thresher, the FACOMAS (Farmers' Cooperative Marketing Association) were invited to participate. Of the 20 table threshers delivered for trial in the dry season of 1970, only 11 were used by 23 farmers. In the following wet season, the number of users was reduced to 14 with 7 new ones; thus, only 7 out of the original 23 users continued using the machine. The rest would like to see it again in the next wet season when *tilyadoras* are not

available. The reasons for the rejection of the table thresher (20 delivered, only 11 were used) are quite revealing:

(1) In one FACOMA, the matter of the table thresher was discussed with a representative from hired labor. Predictably, he opposed the acquisition of the machine lest it reduce their earnings if not totally displace them, since hired labor was performing the harvesting, threshing and winnowing tasks in the community. The FACOMA manager himself said that he would utilize available family labor if there was a table thresher. Peace and order conditions being what they were at the time, the manager feared that hired laborers would steal the motor or sabotage the whole machine.

(2) Technical difficulties in operating the machine. The complaints aired were: difficulty of transporting the table thresher because it was heavy, unstable, and there was not sufficient area to hold on; threshed rice needed cleaning and winnowing; operators and helpers got rice dust all over their bodies; and threshing capacity was lower than that of the *tilyadora.*

(3) One FACOMA owned a *tilyadora* which serviced members at 4 percent.

These reasons for rejection can be reduced to problems with the innovation itself and resistance from vested interests. Actually, the table thresher is not likely to displace much labor because its threshing capacity is much lower than that of the *tilyadora* but the number of people required to operate it ranges from 4 to 8. The users of the table threshers were asked to rank the three methods of threshing on the basis of six attributes and came out with the following:

	First	Second	Third
1. Capacity	McCormick thresher	Table thresher	Hand flailing
2. Least effort expended	McCormick thresher	Table thresher	Hand flailing
3. Cleanliness of grains threshed	McCormick and hand	Table thresher	
4. Least grain damage	Hand	Table thresher and hand	McCormick
5. Least spillage	Table thresher	Hand	McCormick
6. Can thresh wet rice	Table thresher	Hand	McCormick
Overall	McCormick	Table thresher	Hand

This evaluation leads one to conclude that an *intermediate*

technology is *intermediate* in what it can do. But there are other observations which are relevant. With a table thresher, family labor could be employed, thus minimizing losses from hand threshing which arise from the practice of throwing away rice stalks even when grains are still present. The intent is to have "gleaning" companions clean up the hay after threshing. The more grains left in the hay, the more grains will be gleaned. Most of the farmers look at the table thresher as a useful machine if and when the tilyadoras could not service them. Domingo's prognosis is that the tilyadora is not likely to be replaced by the table thresher. However, in view of the big Pantabangan Dam project which envisions double-cropping and continuous irrigation, prospects for the adoption of the table thresher may be better because the rice fields are expected to be wet all the time, thus making it difficult for the tilyadora to reach them.

When asked about labor implications of the table thresher, 77 percent of the respondents who used the machine stated that there would be no labor displacement and it would, in fact, increase the demand for labor. Labor to them was so scarce that they would still need to hire harvesters, feeders and grain cleaners. They believed that harvesting and threshing would be hastened and labor demand would be created for other farm operations such as land preparation, planting and weeding. The 23 percent who said that adoption of the table thresher would result in labor displacement attributed this to the anticipated shift to family labor and the loss of jobs for those who do hand threshing and who operate the tilyadoras.

The row seeder which is intended for direct seeding again appears to be labor displacing until one examines the disadvantages which farmers cited such as the need for leveled and thoroughly prepared land, more weeding, its non-applicability on farms larger than 3 hectares and non-applicability during the rainy season. Furthermore, the seeds are more exposed to rats, birds, and chickens. All these things which require additional attention on the part of the farmers probably make up for whatever labor is saved from transplanting.

In general, the respondents complained of shortage of hired labor which led them to use more family or exchange labor or both. At the peak of labor demand, farmers often made advanced payments in order to have priority on hired labor. It is also significant that most of the farmer's credit was spent for payment of labor.

C. Changes in Farming Status

One of the issues relevant to the effects of changing agricultural

technology is related to changes in tenure and farming status. From available benchmark and terminal survey data gathered in 1963 and 1968, Cuento[14] was able to identify and analyze the patterns of change which took place among 338 of such shiftors located in 36 Laguna barrios. Of the 338, a total of 226 shifted from farm operators to hired farm laborers and non-farm work; 72 shifted from hired farm labor to farming. To facilitate the discussion, the first group will be designated as *farmer-operator shiftors* and the second, *farm laborer shiftors,* although Cuento's analysis called them farm to non-farm and non-farm to farm shiftors. Tables 5.13 and 5.14 present the nature of the shifts which had taken place over a period of 5 years. Table 13 shows 45 farmer-operators, 37 of whom were share-tenants in 1963 and became hired farm laborers in 1968. On the other hand, of 32 hired farm laborers, 22 became share tenants (Table 5.14). What is also noticeable is the number of coconut share tenants who became hired farm laborers (Table 5.13). Because this analysis of shiftors was only an interesting afterthought rather than a planned research objective, not all the respondents gave explanations for the shift in status. Nevertheless, the reasons cited by those who either volunteered or were incidentally asked the question provide the range of possible explanations (Table 5.15). What is noticeable in these cited reasons is the predominance of factors other than "farm being taken away by the landlord," which has often been speculated as an undesirable consequence of the new rice technology and the concomitant yield increases. However, regardless of crops grown, the trend was farmer-operators shifting to hired farm laborer.

Regardless of what the reasons are for shifting from one tenure status to another, evidences show that increase in earnings and in production accompanied both types of shifting. Among the farmer-operator shiftors, the levels of gross earnings changed from 57 percent to 47 percent under the low income category; 29 to 38 percent in the middle income and 9 to 13 percent in the high category from 1963 to 1968. The average rice yield per hectare of those who were farming in 1963 was 36 cavans per hectare for the wet season and 43 for the dry. On the other hand, the farm laborers of 1963 who became farmer-operators in 1968 had average yields of 69.5 and 78.8 for the wet and dry seasons, respectively. However, the 1963 farmer-operators cultivated larger farms than those of 1968.

Incidentally, when asked what they considered as the chief

[14]C. M. G. Cuento, "Occupational Mobility in the Rural Setting: Rural Change in Philippine Setting," *op. cit.*

Table 5.13. Patterns of shift from farm-operator to hired farm laborer.

1963 Crops Produced and Tenure Status	1968 Occupational Status									
	Hired farm laborer	White collar	Blue collar	Proprietor	Hired Farm Laborer & White Collar	Hired farm laborer & blue collar	Other combinations[a]	Jobless	N	%
Rice:										
Share tenant	37	1	7	2	1	6	3		57	
Lessee							1		6	
Share Lessee	5				1				1	
Part-owner	1			2[c]					3	
Owner-operator		2	2	4					8	
Free use	2	1	1		1				5	
Subtotal	45	4	10	8	3	6	4		80	
Percent	56	5	12	10	4	7	5			99
Coconut:										
Share tenant	57	3	12	2	2	51	8	1	136	
Owner-operator	2	4	1	5	1	2	2	2[d]	19	
Part-owner	1							1	2	
Subtotal	60	7	13	7	3	53	10	4	157	
Percent	38	4	8	5	2	33	6	3		99
Rice & coconut:										
Share tenant	7		2		1	3	1		14	
Owner-operator[b]		1		3			1		5	
Sub-total	7	1	2	3	1	3	2		19	

Table 5.13 (Continuation)

1963 Crops produced and tenure status	*Hired farm laborer*	*White collar*	*Blue collar*	*Proprietor*	*Hired farm laborer and white collar*	*Hired farm laborer and blue collar*	*Other combinations*[a]	*Jobless*	*N*	*%*
Others:										
Share tenant	1		1			1			3	
Owner-operator		1					1		2	
Free use	1								1	
Sub-total	2	1	1			1	1		6	
Data not clear	1		1	1				1	4	
Grand total	116	13	27	20	7	63	17	5	266	
Percent	43	5	10	7	3	23	6	2		99

[a]Includes the following combinations:

hired farm laborer and proprietor	12
blue collar and proprietor	2
white collar and proprietor	3
Total	17

[b]Each crop planted to different parcels of land.

[c]One respondent has sugar cane also but plants on another piece of land.

[d]Sick or old already, supported by family.

Source: C. G. Cuento, Table 6 – Nature of shift from farming to non-farming, *op. cit.*

Table 5.14. Patterns of shift from hired farm laborer to farm-operator.

1963	1968 Farming Occupations															Grand Total N %
	Rice[a]							Coconut			Other crops[b]					
	Share tenant	Lessee	Share lessee	Owner operator	Part-Owner	Free use	Sub-total	Owner operator	Free use	Sub-total	Share tenant	Owner operator	Part Owner	Free use	Sub-total	
Hired farmer laborer	22	5	2		1	2	32	3	1	4	3	1		2	6	42
Blue collar	1	5		5			11	1		1			1	1	2	14
Proprietor	1						1	2		2	1				1	4
Others[c]	4	1	1				6					2			2	8
Jobless	3						3				1				1	4
Total	31	11	3	5	1	2	53	6	1	7	5	3	1	3	12	72
Percent							74		40						16	100

[a]Three producers had rice with other crops, all in upland areas.

[b]Includes vegetables and corn.

[c]Combination of hired farm laborer and blue collar, livestock raiser and hired farm laborers.

Source: C. G. Cuento, Table 7 – Nature of shift from non-farming to farming, *op. cit.*

Table 5.15. Reasons for shifting.

Reason	*Number responding*
Farmer-operator to farm laborer:	
Old age	6
Sick/sickly	6
Farm taken away by landlord	8
"Nalulugi" (losing) due to typhoons,[a] drought, infestation, etc.	7
Farm sold to pay debt	2
Working animal died/lost	5
Farm given up due to other jobs (blue-and-white collar jobs).	4
Engaged in fulltime jeepney or tricycle business	2
Rented his farm to someone else	1
Farm borrowed by father-in-law	1
Decided to work with father	1
Total	43
Farm laborer to farmer-operator:	
Was able to acquire a farm[b]	4
Bought the right to work on the farm	2
Farm taken over by father from son[c]	1
Inheritance	1
Given free use of land	4
Taken as subtenant	1
Bought a farm	1
Income from non-farm job not enough	3
Was able to acquire farm animal	1
Total	18

[a]This was especially true in the San Pablo area. There were very destructive typhoons in 1966 and 1967.

[b]How the farm was acquired was not specified.

[c]Respondent was father, non-farmer before.

Source: C. G. Cuento, Table 5. *op. cit.*

barrier to the achievement of family goals for a better and more progressive life, inadequate family labor was cited by the farmers of 1968. The average labor potential in terms of number of family members who could help in farming was about 2.73 for nuclear households, which made up 75 percent of all households studied, and 4 percent for extended households. However, sizes of households were 6.4 and 7.5, respectively. This probably means that other

children were still young and could not contribute significantly to labor needed for the farm. If the situation described in Cuento's study is widespread in the country, then it is truly ironical that we have a combination of small farm, large family size but inadequate family labor, hence an increased productivity per unit area and per labor input seems to be called for in order to support a large family. Here, agricultural innovation and population do seem to interact in a not-too-encouraging manner.

D. Changes in Farm Labor Patterns

With increasing population pressure, land reform and changes in rice technology, labor patterns have shown changes. Table 5.16 presents data on tenure status and family labor utilization based on man-days of potential labor per farm. The evident trends are: (a) There was an increasing proportion of available family labor being devoted to farm work by owner-operators, part-owners, lessees and lessee-tenants, with the latter two categories exhibiting the largest increase. (b) Share tenants decreased the proportion of family labor input on the farm but showed quite an increase in non-farm work. (c) On the whole, owner-operators and part-owners did not show as much change in the allocation of family labor to farm, non-farm and off-farm work. On the other hand, lessees, more than lessee-tenants and share tenants registered a reduction in potential man-days of family labor not gainfully employed. Considering the larger increase in family labor input for farm and non-farm work and the reduction of non-gainfully employed man-days among lessees than among any of the other tenure groups, perhaps land reform could be credited with having contributed to increased labor absorption. However, the change could not be attributed completely to land reform because share tenants also showed a reduction in non-gainfully employed labor. Furthermore, labor input in non-farm work increased for both lessees and share tenants. On the negative side, one wonders why owner-operators and part-owners have lower family labor input and have more non-gainfully employed man-days than the three other tenure groups. This is contrary to everything that has been said about the expected outcomes from ownership of land. What implications does this have for absorption of family labor, given "Operation Land Transfer" or the shift from leasehold to owner-operatorship?

For a close scrutiny of the changes in labor patterns which

Table 5.16. Average family labor utilization of tenure based on number of days potential labor per farm.

Tenure	Farm work			Off-farm work			Non-farm work			Not gainfully employed		
	1963-65	1967-68	1968-69	1963-65	1967-68	1968-69	1963-65	1967-68	1968-69	1963-65	1967-68	1968-69
	— Percent Distribution —											
Owner	14.7	15.3	16.3	0.3	1.2	0.2	13.4	16.8	12.8	71.6	66.7	70.7
Part-owner	11.6	15.9	16.1	0.8	1.0	0.6	10.9	13.7	12.1	76.7	69.3	70.8
Lessee	13.4	18.7	22.8	1.2	2.0	1.7	4.0	19.1	15.9	80.6	60.2	59.6
Lessee-tenant	12.9	20.6	21.9	0.4	0.7	1.2	14.9	16.1	12.4	71.8	62.6	64.5
Share tenant	21.7	17.8	18.9	2.5	1.9	1.2	7.1	15.0	20.3	68.7	65.3	59.6
All Farms	18.8	18.2	20.7	1.9	1.7	1.3	7.9	17.3	16.0	71.4	62.8	62.0
Total no. of farms	524 in Central Luzon											

Data were adapted from P. R. Sandoval and B. V. Gaon, Agricultural Land Reform in the Philippines: Economic Aspects, University of the Philippines at Los Baños, College, Laguna, 1971, Tables 15a, 16a and 17a.

accompanied the shift from the old to the new variety, Table 5.17 indicates a definite increase in total man-days of labor per hectare. The tasks with increased labor requirements are: transplanting, weeding and replanting, harvesting and threshing. Reduced man-days occurred in land preparation both in the case of human and animal labor although there was a slight increase in the use of the tractor. The other significant change was the considerable increase in the use of hired labor while operator, family and exchange labor declined. These data from the Manuel and Lopez study more than any other available data on comparative labor requirements of the traditional and the new varieties, show the difference more dramatically. Perhaps, the fact that the study was done in the early diffusion stage of the new variety explains the dramatic difference. Early adoptors were usually very conscious about the more exacting requirements of the new seeds and therefore devoted more time and labor to weeding especially. Of course, the increased yield also resulted in increased labor for harvesting, threshing and hauling. Now that the new seeds have been widely planted, the comparison between traditional and HYV is difficult, if not impossible to make. The new seeds have become common variety and no longer enjoy special treatment as a general category.

In the interest of labor-absorption, Table 5.18 tells us that it is rather foolish to insist on growing rice when we could solve the rural unemployment problem by producing onions, pole sitao, pineapple, tobacco, cabbage, watermelon, sugar cane, gabi, pechay, tomato and garlic. Unfortunately for the World Employment Program, the Filipino farmers prefer to eat rice and grow rice. The dream of multiple-cropping and diversified farming advocate is to persuade the rice farmer that it pays to grow crops other than rice. However, with market uncertainties and prospective gluts in the supply of cash crops, the farmer is not about to give up his rice. As Marom observed: "Small farmers tend to minimize risks by concentrating their resources on a single crop which will provide them with a maximum amount of security. For most Filipino farmers, this means rice production, even though it may not always be the most economical crop. Farmers encouraged to grow soybeans instead will say ' What if there is no market – I can't feed my family on soybeans.'[15]"

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[15]Assa Marom, Comment on the B. de los Reyes Paper, *Philippine Sociological Review,* Vol. 20, Nos. 1-2, Jan.-April 1972, p. 99.

Table 5.17. Man, animal and tractor utilization per hectare of 100 lowland rice farms in Rizal Province by variety and season, 1967-68.

	Old variety			*New variety*		
	Man	*Animal*	*Tractor*	*Man*	*Animal*	*Tractor*
	Days per hectare					
Wet season						
Land preparation	28.45	19.73	0.53	27.60	15.89	1.35
Transplanting	12.95			17.37		
Weeding and replanting	13.65			29.38		
Other pre-harvest	2.95			5.83		
Harvest, thresh and haul	25.86			30.72		
Total	83.86	19.73	0.53	110.90	15.89	1.35
Hired	45.38			70.79		
Operator, family and exchange labor	38.48			40.11		
Dry season						
Land preparation	28.84	28.08	1.13	24.48	11.24	3.02
Transplanting	18.49			18.76		
Weeding and replanting	22.71			46.28		
Other pre-harvest	5.52			6.67		
Harvest, thresh and haul	25.10			35.97		
Total	100.66	28.08	1.13	132.16	11.24	3.02
Hired	49.65			96.34		
Operator, family and exchange labor	51.01			35.82		

Source: P. C. Manuel and M. P. Lopez, Productivity of Farms Using Traditional and Improved Rice Varieties in Rizal and Laguna, *Seminar on Economics of Rice Production* in the Philippines, IRRI, Dec. 1969 (Cited in C. M. Crisostomo, *et al.,* The New Rice Technology and Labor Absorption in Philippine Agriculture, *Malayan Economic Review.*)

Table 5.18 Labor requirements per hectare of selected crops.

Crop	*Man-days*
Rice	
Lowland-irrigated	77.7
Lowland non-irrigated	70.2
Upland	67.9
Onion	417.1

Table 5.18 (Continuation)

Crop	*Man-days*
Pole sitao	382.5
Pineapple	219.5
Native tobacco	194.8
Cabbage	185.2
Watermelon	171.0
Virginia tobacco	58.1
Sugar cane	147.8
Gabi	141.9
Pechay	111.5
Tomato	108.7
Garlic	84.0
Cassava	73.0
Peanut	61.1
Soybeans	47.0
Camote	45.0
Cowpea	39.5
Corn	37.0
Mongo	31.5
Coconut	24.2

Source: C. M. Crisostomo, *et al.,* The New Rice Technology and Labor Absorption in Philippine Agriculture, *Malayan Economic Review.* Authors derived data from a number of sources.

E. Farm Size, Labor Input, Yield and Income Distribution

Studies on farm size and productivity cited in the chapter on Land Reform showed that regardless of irrigation facilities, tenure status and even before HYV, there is a tendency for smaller farms to have higher yields. Table 5.19 again illustrates this point besides indicating the lack of yield differences among tenure groups. To those who point an accusing finger to the new seeds as being biased toward larger farms, this is disconcerting. Griffin's explanation for the unexpected results is response bias, i.e., a tendency to understate yields and this tendency is inversely correlated with farm size. The larger the farm the greater is the tendency to understate the yield. Therefore, he believes that yield differentials are probably greater in actuality than in reported figures. Having found this likely explanation, he then observed that the smaller farmers also used more nitrogen per hectare than the largest farmers. On the other hand, the latter were twice as likely to use tractors as farmers with less than

two hectares and they were somewhat more inclined to use chemical weedicides and insecticides. Griffin interpreted these findings as the tendency for smaller farmers to use fertilizers largely as a substitute for land while the big farmers tended to substitute machines and chemicals for labor. Large farmers, (being the villains that they are in the green revolution) "produced less per hectare, provided less employment and were relatively more extravagant in their use of scarce capital resources." This, he said, is a characteristic of large farmers whether or not they innovate. If one were to follow this reasoning and if one were to use the Philippine farm size figures he has given (although his source is not stated), 81 percent of farms are small (less than 5 hectares) and, therefore the "green revolution" is a boon to small farmers whether in productivity, innovativeness or labor use.[16] But one is inclined to think that green revolution watchers tend to interpret phenomena in the fashion of "Tails you win; heads I lose."

To avoid falling into the same intellectual trap, it seems more reasonable to find out why smaller farms are more productive. Table 5.20 offers some relevant evidences for three types of farms: (1) two-crop irrigated lowland, (2) one or two-crop irrigated lowland plus other crops, and (3) upland rice and other crops. Data show that smaller farms use more capital, more labor and have higher multiple cropping index than larger farms although the correlation is less than perfect. Predictably, given these inputs, smaller farms have

Table 5.19. Yield per hectare for irrigated two-crop farms, by tenure and farm size, Gapan, Nueva Ecija, 1970 wet season.

Farm size	*Yield (cavans/ha)*			
(Hectares)	*Leasehold*	*Share tenant*	*Owner operator*	*Mean*
Less than 2	61.3(2.7t/ha)	72.6 (3.2)	65.8 (2.9)	68.1 (3.0)
2 to 4	59.0 (2.6)	59.0 (2.6)	61.3 (2.7)	59.0 (2.6)
Over 4	52.2 (2.3)	–	–	–
Mean	59.0 (2.6)	61.3 (2.7)	61.3 (2.7)	49.9 (2.2)

Source: Agricultural Economics Annual Report 1971, IRRI.

[16]Keith Griffin, Economic Aspects of Technical Change in the Rural Areas of Monsoon Asia. UNRISD, Geneva, January 1972.

Table 5.20. Relation of farm size, capital, work units and multiple cropping index to income of different farm types. Albay, 1968-1969

Lowland rice irrigated (LL) 2-crops				*Lowland rice irrigated (LO) 1 or 2 crops and other crops*					*Upland rice and other crops (UO)*				
Farm size	*Capital (Pesos)*	*Work units*	*Income*	*Farm size*	*Capital (Pesos)*	*Work units*	*Multiple cropping index*	*Income*	*Farm size*	*Capital (Pesos)*	*Work Units*	*Multiple cropping index*	*Income*
	— Per hectare — 51 farms				— Per hectare — 27 farms					— Per hectare — 23 farms			
0.50	2,625	448	3,361	1.0	1,225	152	190	1,366	1.0	758	191	150	284
0.50	1,771	274	1,898	1-2	1,965	164	212	654	1-1.5	1,137	85	126	207
0.51-1.25	1,493	208	932	2.1-3	996	146	187	270	1.6-2.5	484	70	143	105
1.26-2.50	1,326	162	344	3.1-5	1,247	124	72	248	2.6-3.5	294	98	117	79
2.50+	1,258	249	218	5.0+	314	121	35	72	3.5+	654	34	123	22

Source: Moises L. Sardido, Income Distribution Patterns of Rice Farms in Bicol. Paper prepared for the Seminar on Economics of Rice Production in the Philippines, IRRI, Dec. 11-13, 1969.

higher incomes per hectare. Again, the small farms appear to be more "virtuous" than the big ones and since there are many of them, technology designed to increase productivity ought to find a hospitable haven among a majority of small farms.

In terms of income distribution resulting from these three farm types, the lowland rice and other crops have the highest Gini Ratio, followed by lowland rice only and the lowest is upland rice and other crops. This suggests that the farm type which offers the lowest income (upland rice) also results in the most equitable income distribution, and the farm type which produces the highest income also offers the least equitable income distribution (Table 5.21). Based on this bit of evidence, the pursuit of equitable income distribution seems to lie in keeping farmers *equally unproductive and poor!*

Table 5.21. Gini Ratio* of the distribution of income (returns above variable costs), Albay, 1968-1969

Farm type	*Gini Ratio*
Lowland rice (LL)	0.3316
Lowland rice and other crops (LO)	0.3615
Upland rice and other crops (UO)	0.3146
All farms combined	0.4126
Rice farms only	0.3521

*Gini Ratio measures the area of concentration of income to the area of the maximum possible concentration. The ratio equals zero if there is perfect equality, and unity if there is perfect inequality.
Source: M.L. Sardido, *op, cit.*

Table 5.22 provides further data on farm size. Again, there is an inverse relationship between yield and farm size. On the other hand, the larger farmers had a greater propensity to use credit. When asked to evaluate their rice profits and level of living in 1971 compared to pre-HYV, there was a curvilinear tendency, with the middle-sized farms reporting lower evaluations. The bigger farms showed a higher proportion saying their level of living was higher in 1971 than in 1965. The smallest farms reported higher profits and level of living than the middle-sized ones.

As far as tenure status goes, share tenants had the smallest

Table 5.22. Farm size by yield, use of credit, evaluation of rice profits and level of living in 1971 compared to pre-HYV.

Yield in cavans per hectare	*Two hectares or less*	*2.1-4*	*4 or more*
		—Percent—	
Below 20	2	2	12
21-40	15	32	40
41-60	33	37	28
61-80	33	18	8
81 or more	17	11	12
	100	100	100
N =	48	120	25
Use of credit	2 or less	2.1-4	4+
Borrowed	44	57	72
Did not borrow	56	43	28
	100	100	100
Evaluation of rice profits in 1971			
Compared to pre-HYV	2 or less	2.1-4	4+
Higher	79	73	76
Lower	17	27	24
Same	4	–	–
	100	100	100
Evaluation of level of living in 1971			
Compared to pre-HYV	2 or less	2.1-4	4+
Higher	77	65	84
Lower	15	30	16
Same	8	5	–
	100	100	100

Source: R. T. Herrera, *op. cit.*

farms, with combination share-lessees having the largest farms, followed by lessees and owner-operators (Table 5.23). The share-tenants who also had smaller farms achieved productivity levels next to owner-operators and higher than lessees. The three tenure groups did not differ in the use of credit but more of the owner-operators,

predictably, felt that their rice profits and level of living were higher in 1965. Clearly, credit was more used by large farmers but smaller farms had higher yields. Level of living and rice profits were considered higher by larger farmers and by owner-operators. Since share tenants had smaller farms, the positive factor in their direction was higher yield than lessees and a lower proportion of them than owner-operators belong to the lowest yield levels (27 against 37) with 40 or less cavan per hectare.

Table 5.23. Tenure status by farm size, yield, use of credit, evaluation of 1971 rice profits and level of living compared to pre-HYV. (3 Barrios of Gapan, Nueva Ecija)

Farm size	*Share tenant*	*Lessee*	*Owner-operator*	*Combination*	*Total*
			– Percent –		
2 ha. or less	31	20	21	9	25
2.1-4	67	65	46	64	62
4.1 or more	2	15	33	27	13
	100	100	100	100	100
N =	89	60	33	11	193
Yield in cavans per ha.					
20 or less	3	3	6	9	
21 to 40	24	37	31	18	
41-60	38	33	24	46	
61-80	23	22	15	9	
81+	12	5	24	18	
	100	100	100	100	
Use of credit Wet 1971					
Borrowed	55	55	52	73	
Did not borrow	45	45	48	27	
	100	100	100	100	
Evaluation of rice profits in 1971 Compared to pre-HYV					
Higher	73	75	82	64	
Lower	25	25	18	36	
Same	2	–	–	–	
	100	100	100	100	

Table 5.23 (Continuation)

Farm size	*Share tenants*	*Lessee*	*Owner-operator*	*Combination*
Evaluation of level of living in 1971 Compared to pre-HYV				
Higher	68	70	78	64
Lower	26	25	15	36
Same	6	5	7	–
	100	100	100	100

Source: R. T. Herrera, *op. cit.*

Among the social evils attributed to the green revolution the one most forcefully put forward by Griffin and others is *increasing inequality.* Unfortunately, as far as the Philippines is concerned, Griffin makes inference without citing evidence directly linking the new technology with the inequality. Examples of his inferences are as follows:

> "In new states of India and Pakistan, . . . incomes originating from agricultural activities are exempt from income tax . . . A similar situation exists in the Philippines. The land tax is negligible and the income tax is low and easily evaded. In fact, as Professor Ishikawa notes, 'No one can look at the Philippine tax system without being shocked by its serious regressive nature! ' Thus, in the three Asian countries which are in the vanguard of the 'green revolution' the most prosperous people in rural areas are subsidized but not taxed; policies have been introduced which ensure that they receive the benefits of the agrarian change while those who are less prosperous incur its costs. The consequences are greater inequality and, in some instances, greater misery."

In a positive-negative concession to the green revolution, Griffin says:

> "There is no doubt that under appropriate circumstances the green revolution can make an important contribution towards increasing agricultural output in underdeveloped countries. The new technology, however, is neither necessary nor sufficient for achieving more rapid growth. Moreover, as we have seen, it has become reasonably clear that the introduction of high-yielding varieties of foodgrains has often been associated with increased economic inequality and greater social dif-

ferentiation in rural areas. Thus, the 'revolution' creates as well as alleviates problems and thereby raised issues of public policy."[17]

On the nature of the green revolution, Griffin regards it as "largely a biological and chemical revolution from a technical standpoint. But from a socio-economic point of view, it has largely become transformed into a commercial revolution. This is a consequence not only of the nature of the technology but also of the government policies which have been used to disseminate it. In practice, the new technology has been successful primarily in the context of commercial agriculture. Moreover, the revolution tends to accelerate capitalist agriculture but does not necessarily initiate it, although it has done so in a few areas."[18]

Keeping Griffin's misgivings about the green revolution in mind, let us take a look at Table 5.24 which supplies the hard-to-come-by data on the direct income distribution effects of the new rice varieties. From the table, the following observations can be made: (1) The range of incomes associated with the local varieties is much narrower than the range for the new varieties, i.e., a more equal income distribution but a very low income level. (2) With the new varieties, 19 percent of the farmers in the first crop and 27 percent in the second crop moved up and out of the ceiling income level of ₱600-₱699. In other words, the income ceiling was raised. Eight percent of those growing the local varieties for the second crop displayed a break from the predominant income levels. (3) Looking at the lower end of the income range (₱300-₱399), we see 78 percent of local variety growers as against only 44 percent for new variety users. For the second crop, the respective proportions found at the lower end are 64 and 40 percent, respectively. (4) In an absolute sense, the income range for local varieties during the first and second crops is very low indeed. Even with the new varieties, the incomes are still low in an absolute sense. (5) With the new varieties, there is undoubtedly a greater income inequality but higher income for most of the farmers. With the local varieties, there is greater income equality but lower income for most of the farmers. The question one is therefore forced to ask is: Which of the two situations would policy-makers opt for? Which of the two situations

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[17]Keith Griffin, Policy Options for Rural Development, Background Paper for the Ford Foundation Seminar on Rural Development and Employment, Ibadan, Nigeria, April 9-12, 1973.

[18]Griffin, *op. cit.*

Table 5.24. Income distribution patterns (returns above variable costs/ha.) among lowland rice farms growing new varieties and local varieties, Albay, 1968-1969

	First crop				*Second crop*			
	New varieties		Local varieties		New varieties		Local varieties	
	%	*Mean income*	%	*Mean income*	%	*Mean income*	%	*Mean income*
		₱		₱		₱		₱
Below 100	18	8.74	19	52.35	7	82.20	8	14.51
100-199	3	194.92	6	182.67	14	147.71	16	163.22
200-299	13	243.30	28	244.81	14	243.26	32	246.85
300-399	10	324.70	25	348.78	5	372.61	8	350.98
400-499	11	462.20	10	475.32	19	422.74	4	469.60
500-599	8	519.36	3	517.50	9	530.41	20	553.51
600-699	18	657.70	9	638.66	5	646.65	4	617.40
700-799	5	742.40	–	–	9	739.29	–	–
800-899	3	855.00	–	–	9	849.78	–	–
900-999	3	920.50	–	–	2	908.22	8	987.81
1000-1099	3	1071.42	–	–	7	1050.42	–	–
1110-1199	5	1129.40	–	–	–	–	–	–
Total	100	457.18	100	297.88	100	481.63	100	363.54

Source: Moises L. Sardido, *op. cit.*

would farmers themselves opt for? One is "equal but poor" while the other is greater inequality relatively speaking, but less poverty in an absolute sense for majority of the farmers. As far as the implications for policy in the interest of equality are concerned, there are at least two options. The first would be to find measures to bring the lower end to a higher plane. The other is to prevent the 19 percent from moving out of the previous income ceiling. In opting for the use of the new varieties, Filipino policy-makers and rice farmers seem to have chosen the path of pushing farmers' income ceiling upwards rather than freezing it to prevent relative inequality and absolute poverty.

The other source of inequality associated with the new rice technology is again pointed out by Griffin. Citing the accompanying table from the International Rice Research Institute, he proceeds to make the following conclusions and predictions:

"It is clear from the above that those farmers who depend on rainfed ag-

riculture are at a considerable disadvantage, particularly compared to those who are able to double-crop their land using irrigation. Farmers in rainfed regions use high-yielding varieties on a minority of their land and obtain yields only two-thirds as high as those in the most favored situation. Since the irrigated farms were more prosperous than the rainfed farms even prior to the introduction of the improved seeds, the new technology led to an *increase in inequality.*

"Furthermore, it would appear that in at least some instances, the use of new seeds on rainfed farms results in a lower net income for the cultivator. On the rainfed farms of Gapan, for instance, between 1965 and 1970 the area under high-yielding varieties rose from 1.7 to 1.8 tons per hectare. At the same time, the amount of fertilizer used more than doubled, rising from 9.2 to 20.5 kg. per hectare and the proportion of farmers using herbicides, insecticides and tractors increased by well over one hundred percent. Since output remained roughly the same while material inputs rose substantially, value added must have declined. Innovation almost certainly led to *greater poverty* on these farms and one could anticipate that *in the future the farmers will revert to the traditional varieties of rice.*

"The story is quite different, of course, on those farms which are able to harvest two crops a year. The new technology causes yields to increase by 20 to 50 percent and net profits undoubtedly rise as well."[19]

Water supply and adoption of high-yielding varieties of rice on 513 farms in Gapan, Nueva Ecija, Philippines, 1970.

	Irrigated 2 crops	*Partially irrigated*	*Rainfed*
1. Percent of areas planted to HYV's	96.5	62.5	31.6
2. Yield per hectare (tons)	2.7	2.1	1.8
3. Nitrogen per ha (kg)	49.8	28.9	20.5
4. Percent of farmers using insecticides	90.5	78.2	56.8
5. Percent of farmers using herbicides	52.0	21.8	11.4
6. Percent of farmers using tractors for plowing	32.0	20.0	22.0

[19]Keith Griffin, Economic Aspects of Technical Change in the Rural Areas of Monsoon Asia, *op. cit.*

Griffin's verdict of greater inequality and greater poverty among rainfed farmers who used the new varieties and his prediction that they will return to the traditional varieties – is not as simple and as self-evident as he illustrates. To probe deeper into the complexities involved in assessing the impact of HYV's, Table 5.25 and 5.26 are presented with data from three barrios of Gapan which have good irrigation (San Nicolas), poor irrigation (Malimba) and rainfed (Mahipon). The rainfed barrio had bigger farms (ave. 3.5), a higher proportion of lessees and owner-operators than Malimba and San Nicolas. While Mahipon and Malimba farmers doubled their application of nitrogen per hectare in 1970, San Nicolas, the well-irrigated barrio, trebled its use of nitrogen. Considering the increased input of nitrogen, the yield increases were quite modest as shown in Table 5.25. Just as Griffin concluded, the irrigated two-crop barrio of San Nicolas shows a distinct advantage over Malimba and Mahipon. Likewise, the verdict of greater inequality appears warranted in the light of the widened yield range which resulted in all three barrios. Does this greater inequality in yield levels mean greater poverty? If one examines the three upper yield levels, Mahipon showed an increase of farmers achieving this from 36 to 49 percent or an increase of 13 percent who moved up into this category. Malimba showed 54 to 64 percent improvement, an increase of 10 percent. San Nicolas moved up from 84 to 96 percent or an increase of 12 percent. Concomitantly, there was a decrease in the proportion of farmers at the lower levels from 1967 to 1970. The advantage of San Nicolas is very evident in that none of its farmers ever belonged to the 20 cavans and below category even before HYV. While San Nicolas is certainly more prosperous than Malimba and Mahipon, on an absolute basis, its yield levels are not high by any means. Although Mahipon and Malimba farmers are worse off than San Nicolas farmers both before and after HYV, they were better off in 1970 than in 1967. Therefore, relative to how they were before, there was less poverty in 1970 than in 1967. This inference is reinforced by findings previously cited in the chapter on "The Changing Filipino Rice Farmer" where a higher proportion of Mahipon than Malimba farmers indicated that their rice profits and level of living were higher in 1970 than in 1965. And when asked to assess the livelihood of people in their barrios who were dependent on rice farming, 97 percent of Mahipon, 90 percent of San Nicolas and only 45 percent of Malimba farmers indicated that they were better off in 1970 than in 1965. Noticeable is the nearly 100 percent of rainfed Mahipon

Table 5.25. Basic characteristics of 193 farms in three barrios of Gapan, Nueva Ecija, 1971.

A. Location characteristics

	Number of farms		Median farm size (ha)	Share tenants (%)	Lease holders (%)	Owner operator (%)	Combination tenure (%)	Median No. of persons in household
	In village	In sample						
San Nicolas	105	55	2.5	56	24	16	4	7.0
Malimba	85	66	3.0	59	23	9	9	6.0
Mahipon	211	72	3.5	26	46	25	3	6.0

B. Cropping characteristics

	Median area in Rice (ha)		Percentage of rice area irrigated		Percentage of rice area doubled-cropped	Principal form of irrigation
	Wet season	Dry season	Wet	Dry		
San Nicolas	2.5	2.5	100	100	91	gravity
Malimba	3.0	3.0	100	100	97	gravity
Mahipon	3.5	–	0	0	0	none

C. Use of modern varieties

	Percentage of farmers making any use of modern varieties		Percentage of rice area planted to modern varieties		Year of greatest adoption of modern varieties
	Wet	Dry	Wet	Dry	
San Nicolas	100	96	100	96	1967 and 1968
Malimba	100	98	98	98	1967
Mahipon	97	0	87	0	1967

D. Average nitrogen (kg) per ha used, wet pre-HYV, 1970 and 1971

	Mahipon			Malimba			San Nicolas		
	1966	1970	1971	1966	1970	1971	1966	1970	1971
Ave. N kg/ha	15	25	25	27	52	54	25	75	93

Source: R. T. Herrera, *op cit.*

Table 5.26. Yield levels in three villages in Gapan, Nueva Ecija, 1967, 1970, 1971 wet season.

Yield in	*Mahipon*			*Malimba*			*San Nicolas*			*Total*		
	Rainfed			Poorly irrigated			Well-irrigated					
cav/ha	*1967*	*1970*	*1971**	*1967*	*1970*	*1971**	*1967*	*1970*	*1971**	*1967*	*1970*	*1971**
	Percent											
Less than 20	8	4	84	2	6	94	–	–	35	4	4	72
21-40	56	47	14	44	30	6	16	4	32	41	28	18
41-60	32	38	2	43	47	–	53	17	33	41	35	10
61-80	4	10	–	10	15	–	30	40	–	12	20	–
81 or more	–	1	–	1	2	–	1	39	–	2	13	–

*Tungro season
Source: R. T. Herrera, *op. cit.*

farmers who gave this favorable evaluation. Ironically, as shown in Table 5.27, there was greatest equality when yields were lowest. This was achieved in 1971 during the *tungro* season when the rice crop was seriously affected by the disease. But again, even in disaster, San Nicolas still was not as badly damaged as Malimba and Mahipon.

Contrary to Griffin's prediction that rainfed farms would revert to traditional varieties and despite the serious tungro infestation in 1971, 95 percent of Mahipon, 97 percent of Malimba and 93 percent of San Nicolas farmers will still plant HYV's because there are other tungro-resistant varieties. One hundred percent of Mahipon farmers believe in the over-all effectiveness of the new rice technology. This faith is substantiated and quantified in Table 5.27 which shows that under best, worst, or average conditions, the rainfed farmers believe that HYV's will give them better yields than the local ones. Though hard hit, they still believe in the new varieties and, therefore, did not behave the way Griffin thought they would.

Stewart, in his analysis of Davao del Sur farmers, shed additional light on this phenomenon. Comparing costs and returns from a "bad" year with HYV and a "good" year with traditional varieties, he found that "even in a bad" year, the farmer who is planting the new varieties ends up only a little worse off than he was during a "good" year with the traditional varieties. The difference in his net yield for sale or consumption is only a little more than 6 cavans for 1967 and 1972. The farmer has learned to expect high

Table 5.27. Average yield reported and farmer yield expectations on irrigated and rainfed farms, Gapan, Nueva Ecija, wet season, 1970.

	No. of farms	Yield reported (mt)	Yield expectations Ave. condition	best condition	Worst condition
			(mt. per ha.)		
Irrigated 2-Crop					
Local	16	1.9	2.0	2.6	1.4
HYV	321	2.8	2.8	3.8	1.8
Rainfed					
Local	109	1.7	1.8	2.6	1.0
HYV	68	2.1	2.4	3.4	1.5

Source: Randolph, Barker, *et al.*, The Changing Pattern of Rice Production in Gapan, Nueva Ecija, 1965 to 1970, *op. cit.*

yields from the new varieties and is naturally disappointed at crop failures, but all things considered, his net farm income today bottoms out at a level not too much lower than the best he could expect using traditional varieties.[20] These observations are rather significant because they emphasize a very important point overlooked in assessing the impact of the green revolution.

For a dissenting conclusion regarding the profitability of HYV, Smith's analysis of rice productivity in Iloilo is presented. Following discussion with agricultural technicians on the Provincial Development Staff, farm management specialists of the Agricultural Productivity Commission, the Bureau of Plant Industry, the Agricultural Credit Administration, several farmers in the province as well as a cooperative manager, he found that on properly irrigated lowland, yields averaged 40-45 cavans per hectare with traditional seeds and 65-72 per hectare with HYV. Given these productivity levels and the costs of production he had calculated, Smith arrived at the conclusion that: "from the farmer's vantage point of income (rather than the technicians' approach of higher productivity) in the lower price ranges which prevail, *the HYV technology is less profitable, per crop than the lower* yielding traditional methodology, for the 'typical' yields cited. Even when higher prices are obtained, the increased profit from the higher yield is marginal, while the cash

[20] J. Stewart, *op. cit.*

outlay requirements more than double. For a typical yield of 100 + cavans per hectare, the HYV technology is clearly advantageous in terms of total profit, but the increased cost, effort and risk involved, place it in a category which most small farmers are either *unable* to attain or are as yet *unwilling* to undertake."

Although this explanation seems very logical, one wonders why there have been a rapid spread and a continuous adoption of HYV if it were less profitable than the traditional varieties. An examination of Table 5.28 shows that Smith's cost of production figures need detailed scrutiny because it makes certain important assumptions. It assumes that traditional variety planters use *no fertilizer,very little weeding or weedicides, no fungicides, little or no insecticide, no straight-row planting, no rogueing, no seed treatment, credit* – and from little or no production inputs, average yields of 40 to 45 cavans are obtained. The second assumption, on the other hand, says that planters of HYV's give their fields the maximum use of fertilizers at all stages in the growing period, weeding, weedicides, insecticides, fungicides, straight-row planting, made possible by the use of credit. With *all* of these *production inputs* and tender loving care the typical yields are said to be 65-72 and rarely go to 100+. In other words, Smith assumed the best performance from traditional varieties with none or *little inputs* and assumed the *lower performance* levels for maximum inputs in the case of HYV. From an agronomic point of view, it would seem that with the high levels of all the input requirements, the productivity should approximate the yield potential of HYV. In order to meaningfully examine the validity of his assumptions, data from 36 barrios of Laguna are presented (Table 5.29). Benchmark data were gathered in 1963 before any of the HYV's were developed and then a survey of the same areas was conducted again in 1968. About 500 lowland rice farmers were studied with respect to changes which had taken place over a 5-year period. Table 5.29 indicates that even in 1963 when old varieties were then the recommended seeds, *zero use* of fertilizer, insecticides, weeding and weedicides, straight-row planting was not the case. Furthermore, 78 percent of the farmers were using credit and therefore were paying interest contrary to *no credit costs* Smith assumed for traditional varieties. Despite the use of these inputs in lower quantities than for HYV's the yield levels for traditional varieties were quite low, with almost one-half in the wet season and one-third in the dry season having yields of 30 cavans and less per hectare. With the adoption of improved and newer varieties, the use of recommended practices also increased and so did

Table 5.28. Estimated per hectare costs for rice culture, Iloilo Province, 1972.

Item or Activity	*Quantity*	*Cost of producing*	
		traditional	*HYV*
		(in pesos)	
1. Seed	1 cavan	₱55.00	₱55.00
2. Plowing		5.00	5.00
3. Harrowing		5.00	5.00
4. Seed treatment		–	7.00
5. Sowing seedbed		5.00	5.00
6. Fertilizing	4 kg. 14-14-14	–	3.00
7. Spraying	2 tbsp. Sevin	–	1.00
8. Irrigating		2.50	2.50
9. Plowing	(By carabao)	60.00	60.00
10. First harrowing		30.00	30.00
11. Draining		5.00	5.00
12. Irrigating		5.00	5.00
13. Second harrowing		30.00	30.00
14. Draining		5.00	5.00
15. Fertilizing	50 kg. Urea	–	153.00
	200 kg. 14-14-14	–	6.00
16. Leveling		30.00	30.00
17. Pulling seedlings		60.00	60.00
18. Transplanting		70.00	90.00
19. Insecticide	1 ltr. Diazinon	–	8.00
	(Foliar)	–	6.00
20. Fungicide	1 kg. copper	–	16.00
21. Replanting		12.00	12.00
22. Insecticide	1 ltr. Gusathion	–	19.00
	(Foliar)	–	6.00
23. Fungicide	1 kg. Hinosan	–	35.00
24. Weedicide	25 kg. Tavion	10.00	74.00
	(Granule)	3.00	3.00
25. Rogueing		–	6.00
26. Weeding		40.00	60.00
27. Irrigating		5.00	5.00
28. Insecticide	1 kg. Folidol	10.00	19.00
29. Fungicide	1 kg. Hinosan	–	35.00
30. Draining		5.00	5.00
31. Top dressing fert.	50 kg. Urea	–	28.00
		–	3.00
32. Irrigating		5.00	5.00
33. Irrigating fee		25.00	25.00
34. Draining		5.00	5.00
35. Interest on loan for labor and materials (₱800 @8% x 1/2 yr.)		–	32.00
36. Harvesting	(Yield x 7% x Selling price)		

Table 5.28 (Continuation)

Item or Activity	*Quantity*	*Cost of producing* *traditional* *(in pesos)*	*HYV*
37. Threshing and drying	(Yield x 7% x Selling price)		
38. Warehouse fees	(Yield x 1/2 peso)		
39. Land rent	variable		

Source: Kenneth F. Smith, Palay Productivity and Profitability in Iloilo 1971-72, US/AID, Philippines 1972. Country Paper for Small Farmer Credit in the Philippines, AID Spring Review of Small Farmer Credit, March 1973, Agency for International Development, Dept. of State, Washington, D.C., March 1973.

their loans from ₱355 in 1963 to ₱595 in 1968. Definitely, even with the adoption of the new varieties by 1968 the input levels applied were far from what Smith assumed in his analysis.

His estimated cost of fertilizer per hectare for HYV is ₱193, ₱110 for insecticide and fungicide, ₱77 for weedicides, ₱60 per weeding and ₱32 for interest on credit. On the other hand, the estimated costs for growing the traditional varieties are *zero* for fertilizer, ₱13 for weedicides, *zero* for insecticides and *zero* for interest on credit. Again, using data from Gapan, Nueva Ecija which appeared in Table 5.9, the actual inputs used and yields obtained in the well-irrigated barrio using HYV are 73.2 kg. of nitrogen per ha. which is roughly the same as Smith's computed N per ha. for all the fertilizer he assumed would be used with HYV; only ₱7.50 per hectare for insecticides, only ₱3.50 for herbicides and only 15 percent used weeders but the average yield obtained is 83.9 cavans per hectare.[21] Smith's assumptions, therefore, need to be re-examined before his verdict could be taken seriously.

What is interesting in Smith's analysis is the income distribution implications of different tenure arrangements whether it is HYV or traditional varieties. The farmer is in the best position under a leasehold, but he is better off on a 50-50 than on a 60-40 sharing arrangement because of the way the costs are shared (Table 5.30). The Laguna data on yield are also interesting because the new yield levels have reduced the proportion of lowest yielders (30 and

[21] R. Barker, *et al., op. cit.*

Table 5.29. Lowland rice production practices, yield, credit behavior of farmers in 36 barrios of Laguna, 1963 and 1968.

	1963	*1968*
	Percent of farmers.	
A. Use of recommended varieties (*old recommended varieties*)		
1. For 1963 – Raminand, Tjeremas, Milfor, Intan, Mangarez, Thailand	69	–
1968 – New recommended varieties – Peta, BPI-76, BPI-76-1, BE 3, IR 8, C-18, FK 178, C4-63	–	83
2. Application of fertilizer	66	82
3. Planting in straight rows	47	65
4. Use of rotary weeder	50	63
5. Use of insecticides	50	66
6. Use of 2, 4-D	60	60
7. Seed selection before harvesting	39	65
8. Germination test	32	41
Total No. of farmers	484	516

B. Yield per ha in cavans

	Wet Season		*Dry Season*	
	1963	*1968*	*1963*	*1968*
	Pre-HYV		*Pre-HYV*	
	– Percent –			
30 and less	44	11	34	4
31-45	32	23	24	14
46-60	18	22	23	17
61-75	4	18	9	16
76-90	1	11	6	16
91-105	1	7	2	11
106-120	–	4	1	11
121-135	–	2	1	6
136 and above	–	2	–	5
Ave. yield (cav /ha)	35	58	41	72

C. Borrowing Behavior

	1963	*1968*
Percent of farmers borrowing	78	88
Total No. of farmers reporting	780	780
Average amount borrowed	355	595
	– Percent –	
Amounts Borrowed		
50 and below	21	16

Table 5.29 (Continuation)

	1963	1968
	Percent of farmers	
51 to 100	16	15
101-200	19	14
201-300	10	10
301-400	7	5
401-500	9	9
501-1000	13	17
1001 and above	5	14
	100	100
	—Percent—	
Length of repayment		
Paid in less than a month	1	2
Paid within 1-6 mos.	16	30
Paid within 7-12 mos.	12	15
Paid within 13 mos. and up	2	2
Not yet repaid at time of surveys in 1963 and 1968	69	51
	100	100

Source: Farm and Home Development Office, Rural Change in a Philippine Setting: A General Report on the Five-Year Project on Alternative Extension Approaches. College of Agriculture, University of the Philippines, 1971.

Table 5.30. Costs and benefits of rice production for typical and atypical yields of traditional and HYV production for an Iloilo share-tenant (50-50) (60-40) and lessee 1972 given the same selling price for rice.

Share tenant (50-50)

	Traditional (cav /ha)			HYV (cav /ha)			
	40	45	65	72	80	90	100
Selling Price at ₱20 per cavan							
Cost	116	124.25	361.25	372.8	386	402.5	419
Income	400	450.00	650.00	720.00	800	900	1000
Profit	284	325.75	288.75	347.2	414	497.5	581
Cost/Benefit	1:3.45	3.62	1.80	1.96	2.07	2.24	2.4

Table 5.30 (Continuation)

Share tenant (60-40)							
Cost	232	248.5	722.5	745.6	772	805	838
Income	480	540.0	780.0	864	960	1080	1200
Profit	248	291.5	57.5	118.4	188	275	362
Cost/Benefit	1:2.07	2.17	1.08	1.16	1.24	1.34	1.43
Lessee (Fixed rental 25% of yield)							
Cost	432	473.5	962.5	985.6	1012	1045	1078
Income	800	900	1300	1440	1600	1800	2000
Profit	368	426.5	337.5	454.4	588	755	922
Cost/Benefit	1:1.85	1.91	1.35	1.46	1.58	1.72	1.86

Source: K. F. Smith, *op. cit.*

less) from 44 to 11 percent during the wet season and from 34 to 4 percent during the dry season. At the upper levels, those obtaining 76 and higher yields increased from 2 to 26 percent in the dry season. As had been previously observed, there was greater equality in yields when they were low in 1963 than when they were higher in 1968. The question again arises: How can we achieve greater equality in yields at the upper level rather than at the lower level?

A purely economic analysis misses the cultural components of different ecological settings which mitigate the most severe of adversities. Actually, the rice farmer is much more sensible than some economists give him credit for. Otherwise, he would not continue to adopt the new seeds which according to Griffin are characterized by several serious disadvantages specified as:

> "First, the high-yielding varieties tend to be more delicate than indigenous plants and require a great deal more care on the part of the cultivator. Second, the new seeds at present available are in general less resistant to drought and flood, and thus require sophisticated irrigation and water control facilities . . . Third, the big-yielding varieties are somewhat more susceptible to disease and infestation by insects and thus require protective applications of herbicides and pesticides. The severe outbreak of tungro in the Philippines in 1970 and 1971 underlines the importance of plant protection. Fourth, the new seeds often but not always — are more productive than local varieties even in the absence of fertilizers but the differences are not very great unless substantial amounts of fertilizer are applied . . . The response of seeds to fertilizer cannot occur in the absence of water, and for this reason irrigation and fertilizer (and perhaps pesticides as well) may be complementary in some countries.

> Consequently, the package of material inputs that accompanies the new seeds may compel massive investment in industries supplying fertilizer and plant chemicals, and expenditure on irrigation works and equipment. Alternatively, many of the necessary material inputs could be imported, if it is cheaper to do this than produce them locally, but this implies a need to earn more foreign exchange or reduce imports of other items. Storage, transport, distribution and marketing facilities must also be provided, and farmers must have access to credit and technical information. Hence, from the point of view of the economy as a whole, the widespread extension of the green revolution is likely to be expensive in terms of fixed and working capital and the opportunity cost of this capital (and of scientific personnel) may be high."[22]

If one reads between the lines of Griffin's arguments, one could infer that the more equitable and less miserable course of action for us to take would be the least expensive one of maintaining local varieties, no fertilizer, no mechanization, no irrigation, no insecticides, no tender loving care to rice plants, no credit, no extension and no input of scientific personnel who could be spending their time more profitably doing something else. And since he is also worried about increasing commercialization in agriculture, there would be less poverty and greater equality if rice farmers remained subsistence-oriented, preferably at equally low productivity levels. In this way, we save precious foreign exchange and are spared the problems of storage, transport, distribution, marketing facilities, credit and extension of technical information to farmers. Who knows? This might also solve the food and population problem.

Fortunately, as stated earlier, rice farmers are much more adoptive and versatile in their adoption and use of a combination of strategies, only one of which is the new rice seeds. Fegan illustrates this versatility in his description of farmer's response to problems in different ecological settings, such as:

> "Zone I. *Low-lying swampy zone subject to seasonal flooding.* In Candaba swamp and its fringes, daily season floods cannot be drained; in the dry season the area is at the end of gravity irrigation, hence worst served. Rice is the main crop but yields are unpredictable because farmers cannot control water levels. Deeper floods wipe out crops about two years out of five, and farmers are unwilling to risk cash investment. The short-stemmed, early-maturing nonseasonal, high-yielding varieties of rice developed at the IRRI (IR 8) which do best with high inputs of nitrogenous fertilizer, are not well adapted to the swamp. They may be drowned when

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[22] K. Griffin, *ibid.*

young, or yield very poorly if immersed during flowering or panicle stage, while fertilizer is as likely to be flushed out by a flood as to benefit the crop. The traditional long-stemmed, long-maturing seasonal varieties are less prone to be drowned and flower after the season when floods can be expected. The strategy of planting the lower yielding traditional varieties appears to make good sense. But even so, in only three out of five years can a reasonable harvest be expected.

"On the other hand, this area is probably best favored for subsistence. Fish, frogs, and shellfish are in good supply, and some are sold for cash in the town market. The house lots along river levees provide bamboo, firewood and fruit trees; in the dry season, vegetables are grown on the sandy loam, stream banks and cucurbit cash crops in narrow strips irrigated by pump from streams backed up with weirs. Farmers tend to adopt a subsistence rather than a cash strategy.

"The share tenancy and debt systems have been made easier on tenants in the swamp because of the history of agrarian unrest. Landowners and *katiwala* (estate overseer) are disinclined to acquire a reputation for being harsh in supervision of harvest and crop-division or collection of debts, for fear of reprisals. . . . . .

"Zone II. *Flat, nonflooding area with some gravity and pump irrigation.* This zone is basically one-crop, rainfed land, although some parts have supplementary irrigation from private or government schemes to guard against the field drying out. Drainage and flooding are not general problems. The limited area in the north served by a branch of the Peñaranda River Irrigation Scheme is a schedule to receive enough water for two crops one year in three. A second crop can also be grown in narrow strips close to more reliable streams by pump river water to labor-intensive cucurbit cash crops. The area is closest to the main North-South highway and transport to jobs is convenient. Subsistence is neither as practicable nor as necessary as in the swamp; farmers are cash-oriented. This is the area most favorable to rice-farming; farmers have a degree of control over water, and are ready to risk cash inputs. The high-yielding IRRI varieties and varying degrees of the associated technology have already increased yields and farmers generally are optimistic that yields can be further raised. . . . . The principal problem in the way of increasing harvest remains water control and extension. The Peñaranda River Irrigation Scheme schedule provides sufficient water for two crops only one year in three, while poor maintenance, favoritism, and anarchy in the distribution of water along sublaterals often cause water shortage, particularly near the extremities of the system. Certified seed is difficult to obtain within 50 kilometers of the area and is double the standard price. Agricultural chemicals are only now beginning to have intelligible recipes and precautions, common measures and meaningful names or descriptions of pests and diseases printed in Tagalog on the package. Lack of information about economical and

practicable methods is the main barrier to change; only in the case of rats is there important cultural resistance to pest control.

"Zone III. *Rolling rainfed land.* This area has no drainage problem, but is nonirrigated, one-crop land depending on rain trapped in irregularly shaped paddies following the contours of low hilly country. Soils are generally more permeable and fields dry out more quickly than on the clay lowland. Dry-season crops are at present unimportant, but recent experiments by IRRI show promise.

"Subsistence here is poor. Streams are intermittent and home lots on slope land dry out quickly. The result is that tree crops are not vigorous and vegetables must be laboriously handwatered from the pump. Because there are few jobs in the area, there are relatively few landless workers. Further, during the long dry season even farmers go away to work and send back remittances. However, the farmers are cash-oriented and have taken enthusiastically to the use of chemical fertilizer, and certain high-yielding varieties of rice, notably IR-5 which proved unexpectedly productive despite occasional drying out of the fields. . . . . The greater frequency here of tenants who became lessees even before the latest amendment (R. A. 6389) may be because of the difficulty small or medium owners with dispersed holdings had in supervising and collecting shares, the freedom from debt given by dry-season off-farm earnings and the non-dependent example of the owner-cultivators.

"Submarginal farmers — In all three areas those farmers with larger farms have had higher absolute harvest, hence have been better able to make the necessary cash inputs to improve per-area yields and to retain enough to self-finance the next crop. In the flat land (Zone II), especially if it is nonirrigated, a farm under about two hectares is submarginal, in the sense that under present standard yields of about 50 cavans per hectare, it is insufficient to support a normal-sized household. The required area may be above two and one-half hectares in the rolling terrain (Zone III), three hectares in the swamp (Zone I). Farmers in those zones with less land, unless they have off-farm sources of income that permit sufficient time off for farming in season, tend to be trapped in a cycle of debt and dependency on owners, to have poor yields because they cannot afford or risk cash inputs and to be the least willing to transfer to legal leasehold."[23]

Without meaning to glorify degrees of poverty associated with different ecological settings (none of them are really well-off in an absolute sense), one realizes the variety of mitigating circumstances within the culture which enables people to survive. Therefore, the impact of agricultural innovation is very much influenced by the nature of ecology and the combination of social and cultural

[23]Brian Fegan, Between the Lord and the Law: Tenants Dilemmas, *Philippines Sociological Review,* Vol. 20, Nos. 1-2. Jan.-April 1972, pp. 114-116.

circumstances obtaining in the area where it is adopted. It is infinitely more complex than the apprehension of the "rich getting richer and the poor getting poorer." Some people are poor in absolute terms while others are poor only in a relative sense. But the question still arises with respect to equality: Equal to whom? With respect to what? A country can be equally poor within itself but terribly unequal with respect to another country. The frame of reference for equality should, therefore, be made explicit if equality is what we mean to achieve. The next question is how we can solve the problem of absolute poverty without producing greater inequality. But to pursue equality *per se* without attention to alleviating absolute poverty where it is extensive is a strategy which is not likely to be popular. If we can be *equal but rich,* why not? International development experts seem to know how to make the rich less rich (provided perhaps they do not have to suffer) but it is infinitely more difficult to make the poor less poor, if not rich. There are more measures proposed for the former but not very creative and effective proposals for the latter.

F. Off-Farm and Non-Farm Employment Aspects of Rice Production

Any assessment of the employment and income situation of rice farmers whether growing old or new varieties is incomplete and even misleading if the off-farm sources of income and employment were not taken into account. As Fegan describes it:

> "Off-farm work can complement farming in three ways. First, the farmer has a cash flow for subsistence, education of his children, and social expenditures and is likely to go into debt. At the prevailing 50 percent or more interest for non-agricultural loans from money lenders and 50 percent subsistence ration during farming season only from landowners to tenants, the farmer with a 'side-line' income does not have to repay capital and interest at harvest . . . . Second, good rice-farming now and in the future will need increasing cash inputs for mechanical cultivation to shorten the time the land is idle, for certified seeds, chemical fertilizer, insecticides and weedicides, and supplementary irrigation. No matter how much time a farmer has, however, he cannot substitute it for cash to meet this need except in the case of weeding. On the other hand, except for the daily cutting of grass for carabao during the palay season and brief attention to water levels, the tasks required for good protection and maintenance of growing rice are not constantly demanding, and can be accommodated to a job under prevailing conditions. Third, an off-farm job allows the farmer to spread his risks and is a cushion against crop failure. Hence, it need not

be economically rational for the farmer (and much less his household) to withdraw from off-farm work. Some who do withdraw in response to higher income from the farm do so not to work harder on the farm, but out of a preference for leisure."

Fegan disputes Takahashi's claim that lessees are abandoning paid off-farm work to concentrate on the land. He argues that the farmer does not have to allocate his labor to either full-time job or full-time farming, but can strive for the optimum mix of both, balancing his need for cash against the need for attention to his farm.[24] In Sandoval and Gaon's data from Table 5.16, lessees increased family labor spent on both farm and non-farm work, while share tenants decreased their family labor for farm work but increased it for non-farm work. This partly supports Takahashi's contention, but Fegan's argument seems plausible too because lessees as well as share-tenants devote increased family labor to non-farm work. What is more significant is that from 1963 to 1969 both lessees and share-tenants reduced the proportion of their family labor which was not gainfully employed. This means that for these two tenure groups, absorption of family labor had improved but for owner-operators and part-owners it had remained essentially the same.

Over an eight-year period from 1962 to 1970, 14 out of 16 cooperators (8 share tenants and 8 share lessees) from a farm-record keeping project showed increased net shares. One of them experienced a decline in net share as a result of drought and rat infestation, and the other one experienced practically no change in net share for the same reason. Accompanying the increase in net shares from rice production was an increase in non-farm income for 13 out of the 16 farmers. Eighteen different sources of off-farm and non-farm family income were mentioned by the 16 farmers: tricycle driving, buy-and-sell of rice, crops, livestock, etc; sari-sari stores; tractor rental and operation; harvesting rice; duck raising; sale and hiring out of carabaos; taking care of coconuts; carpentry; dress-making; working in the factory; working in sugar-cane fields; gathering banana leaves; laundry; fishing; poultry raising and money sent by son in the navy.[25]

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[24]Brian Fegan, Jobs and Farms: The Lessees' Alternatives and Peasantization, *Philippine Sociological Review,* Vol. 20, Nos. 1-2.

[25]E. P. Abarientos, *et al.,* Impact of Technology and Small Farmers and Their Families: An Eight-Year Experience in the Farm Record-Keeping Project, 1962-1970. Dept. of Agricultural Economics, U.P. College of Agriculture, Aug. 31, 1972.

In order to obtain a more detailed picture of the role which off-farm and non-farm incomes play in the life of rice farmers, Herrera focused specifically on the rainfed farmers of Mahipon who grow only one crop of rice a year. It has been a puzzle as to how they manage to survive, considering the relatively low yields and even in the wake of tungro infestation.

Table 5.31 indicates quite clearly that only 3 out of 69 farmers household-heads do not have off-farm income. They are not alone in the business of earning a living, for their wives, sons and daughters make their own contributions in this regard. The reason for the lower proportion of children participating in off-farm income earning is their youth. Majority are below 10 years. Almost half of the wives join in breadwinning. All of the 69 households have backyard non-rice enterprises during both seasons. Tables 5.32 to 5.35 give us an idea as to what these sources of off-farm income are. It is evident that the rice farmers themselves, their wives and children work as hired farm labor for other rice farmers both within and outside Mahipon. Harvesting, transplanting and pulling seedlings and fishing are the most predominant jobs engaged in. From these tables, one could also find support for Fegan's view that off-farm jobs complement rather than conflict with their own farming because these off-farm jobs are engaged in precisely during the crop season when the farmers are growing their own rice crop.

Table 5.35 shows that backyard poultry and piggery projects are a source not only of food but also of cash.

In monetary terms, these various off-farm activities generate as much as ₱132,430 for the barrio, with an average of ₱1,919 per household of a little more than 2 off-farm income earners. This total off-farm income ranges from ₱500 to ₱6,000 and therefore adds substantially to whatever returns are obtained from rice farming. The fact that majority of these off-farm jobs also come directly from rice production means that it is incomplete and inadequate to reckon employment effects only in terms of the labor input on the farms they are operating, because they obviously derive income from other rice farms. The Mahipon rice farmer is therefore both a farmer-operator and a hired farm labor (Table 5.36).

Stewart has the same observations in his Davao del Sur study and makes the point that the Philippine farm community must be examined as a system rather than as a series of self-contained farm units. The economics of rice farming goes beyond the purview of individual farm units and computations strictly centered on returns

above variable costs do not tell the whole story. As Stewart describes it:

"Farmers and their families in these communities work for each other in such tasks as pulling and transplanting seedlings, weeding, and harvesting. Farmers estimate that they spend ₱140 per hectare for pulling and transplanting seedlings which amounts to ₱250 per farm. Most labor for these tasks is drawn from within the community, so even if 20 percent of the work force comes from outside the community it would still leave – if evenly distributed about ₱200 per family in off-farm income. Weeding is less significant on an average basis due to the use of family labor and herbicides, but in harvesting, the harvester's share of 1 in 11 amounts to about 5 cavans per farm. If evenly distributed among families in the community, this would mean an additional income of ₱115 per family.

"These figures do not include additional farm income from the sale of eggs, vegetables, meat, etc. or income from non-farm sidelines in which many farm families are engaged. . . . So as a system, if labor costs are not computed, there often exists a state of near equilibrium in which the average farmer does not get too far ahead but does not fall too far behind either."[26]

Table 5.31. Household members of 69 Mahipon rainfed farms with off-farm income (1971), Gapan, Nueva Ecija.

Household members	*Total members of 69 households*	*Percent of household members with off-farm income*		*Household members with off-farm income*		
				Crop season only	*Off-crop season only*	*Both seasons*
Husbands	69	66	94%	50	14	41
Wives	64	29	45%	24	1	6
Sons	132	38	28%	37	2	10
Daughters	139	31	22%	30	1	5
Total	404	164		141	18	62
No. of household with non-rice farm enterprise				25	4	69
Total number of households					69	
Ave. size of household: 5.85					Ave. No. of off-farm income earners per household: 2.38	

Source: R. T. Herrera, *op. cit.*

[26] J. C. Stewart, *op. cit.*

Table 5.32. Sources of off-farm income for 69 households of Mahipon rainfed farms (crop season).

Occupation	*Husbands*	*Wives*	*Sons*	*Daughters*	*Total*
Harvesting	39	11	28	13	91
	8	15	23	27	73
Pulling seedlings	3	1	8	–	12
Fishing	19	–	4	–	23
Tractor operator	5	–	–	–	5
Threshing machine contractor	2	–	–	–	2
Buntal hat making	–	1	–	–	1
Storekeeper	–	1	–	–	1
Catching frogs	1	–	–	–	1
Food vendor	–	1	–	–	1
Selling bags	–	1	–	–	1
Vegetable gardening	1	–	–	–	1
Buy-and-sell animals	1	–	–	–	1
Total	79	31	63	40	213

Source: R. T. Herrera, *op. cit.*

Table 5.33. Sources of off-farm income for 69 households of Mahipon rainfed farms (off-crop season).

Occupation	*Husbands*	*Wives*	*Sons*	*Daughters*	*Total*
Carpenter	9	–	–	–	9
Gathering firewood	3	–	–	–	3
Tailor	–	–	1	1	2
Truck driver (bakery truck)	1	–	–	–	1
Market vendor	–	1	–	–	1
Buy-and-sell (carabao)	1	–	–	–	1
Fishing	1	–	–	–	1
Catching frogs	1	–	–	–	1
Jeepney driver (passenger jeepney)	–	–	1	–	1
Total	16	1	2	1	20

Source: R. T. Herrera, *op. cit.*

Table 5.34. Sources of off-farm income of 69 households of rainfed Mahipon farms (both seasons).

Occupation	*Husbands*	*Wives*	*Sons*	*Daughters*	*Total*
Fishing	26	–	5	–	31
Carpenter	3	–	–	–	3
Tricycle driver	5	–	4	–	9
Tricycle mechanic	1	–	–	–	1
Storekeeper	–	2	–	–	2
Selling carabao's milk	7	–	–	–	7
Jeepney driver	2	–	–	–	2
Truck driver (gravel and sand)	1	–	–	–	1
Making "singkaw"	1	–	–	–	1
Catching birds	1	–	–	–	1
Making slippers	–	–	–	2	2
Dressmaking	–	–	–	2	2
Buy-and-sell (animals, palay, jewelry)	1	2	1	–	4
Elem. school teacher	–	2	–	–	2
Beautician	–	1	–	–	1
Barrio self-defense unit	1	–	–	–	1
Catching frogs	2	–	–	–	2
"Kiskis" (rice mill) operator	1	–	–	–	1
Restaurant cashier	–	–	1	–	1
Security guard	1	–	–	–	1
Total	63	7	11	4	75

Source: R. T. Herrera, *op. cit.*

Table 5.35. Off-farm enterprises of 69 households in rainfed Mahipon.

Household off-farm enterprise	*Crop season*		*Off-crop season*		*Both seasons*	
	Home consumption	*For sale*	*Home consumption*	*For sale*	*Home consumption*	*For sale*
	– *No. of households* –					
Vegetable garden	25	1	3	–	11	1

Table 5.35 (Continuation)

Household Off-farm enterprise	Crop season		Off-crop season		Both seasons	
	Home consumption	For sale	Home consumption	For sale	Home consumption	For sale
	— No. of Households —					
Mango trees	–	–	1	1	–	–
Raising chicken	–	–	–	–	65	21
Raising pigs	–	–	–	–	10	58
Raising ducks	–	–	–	–	10	8
Raising goats	–	–	–	–	1	1
Milking carabao	–	–	–	–	2	1
Raising turkey	–	–	–	–	1	–
Ranch	–	–	–	–	1	–

Source: R. T. Herrera, *op. cit.*

Table 5.36. Household off-farm income of 69 farmers of rainfed Mahipon (1971, Gapan, Nueva Ecija).

	Crop season		Off-crop season		Both seasons	
	Household off-farm income	Income from family enterprise	Household off-farm income	Income from family enterprise	Household off-farm income	Income from family enterprise
Total	₱39,604.00	₱1,262.00	₱6,134.00	₱195.00	₱51,407.95	₱33,656.00
Ave. per household	₱ 671.25	₱ 50.50	₱ 383.40	₱ 48.75	₱ 1,168.40	₱ 486.40

Total household off-farm income ₱132,430.00

Ave. per household ₱ 1,919.30

Distribution of Total Household Off-Farm Income

Income Level	No.	Percent
₱500	12	17
501 – 1000	16	24

Table 5.36 (Continuation)

Income level	*No.*	*Percent*
1001 – 1500	11	16
1501 – 2000	11	16
2001 – 2500	3	4
2501 – 3000	3	4
3001 – 3500	1	2
3501 – 4000	2	3
4001 – 4500	3	4
4501 – 5000	3	4
5001 – 6000	4	6
Total	69	100

Source: R. T. Herrera, *op. cit.*

In other words, within the rice farming community there are built-in institutional devices for employment and income distribution. The higher the yields, the more rice there is to harvest, the greater the harvest's share. And since farmers and their families work for each other the yields and work opportunities are "shared" and distributed in a number of culturally accepted ways. The growing trend toward the use of hired labor does not necessarily mean that members of farmer-operator households are doing less farm work but rather they are performing hired work for others while other farmers and their families work for them. Because of the dearth of studies on farm labor in the Philippines, it is impossible at the moment to determine how extensive this farm labor pattern is. A related question pertains to how large the population is of landless farm laborers in the rice-growing areas. With the population pressure on land, how many of the farmer-operators' children could expect to be farm laborers? At least in the Philippines, the category labeled *hired farm labor* includes (1) the farmer himself who could be a tenant, lessee or owner-operator who hires out his services to other farmers on a part-time basis; (2) the wife and children of the farmer who work for other farmers; and (3) the landless laborers and their families who do not have land to cultivate and are therefore dependent on work available from farmer-operators.

The practice of working for each other for pay in cash or kind

partly solves the disadvantages associated with the traditional system of unpaid family labor where children render "free" services on the family-operated farm. Although obviously they receive food, shelter, etc.; there is little, if any cash payments involved because it is considered a duty for children to work on the family farm and that such labor should not be given wages but spending money only (Table 5.37). Wife and children are also very much part of the decision-making on the farm. More than 80 percent of farmer-respondents believe they should discuss important matters with the wife and children. However, 34 percent of them do not think that all farm labor should be provided by family and relatives.

Table 5.37. Bukidnon lowland rice farmers' attitudes toward family labor (1972)(379 farmers).

Attitude	*Agree*	*Disagree*
	Percent	
1. Children sharing in family farm work should not be paid their wages for their share of labor because they are members of the family.	78	22
2. All farm labor should be provided by members of the family and relatives.	66	34
3. Work of children on the farm is a duty.	92	8
4. Children who work on the family farm should not be given wages.	78	22
5. Children who work on the family farm should be given spending money only.	91	9
6. A farmer should not discuss important farm matters with his wife.	13	87
7. A farmer should not discuss important farm matters with his children.	18	82

Source: L. A. Chua, *op. cit.*

G. Labor Absorption in Non-Agricultural Activities

With increased family income associated with increased yields and off-farm jobs, rice farm families have reported increase in

consumption items like food, household furniture, improvements in housing, bicycles, farm implements, expenditures on children's education, etc.[27] Gibb made an attempt to quantify the impact of about 25 percent increase in farm income (mainly rice growing) on labor absorption in non-agricultural activities in the local urban center of Gapan and three of the surrounding rural towns.[28] The research used establishment surveys to reconstruct the history of non-agricultural employment since 1966 in and around a set of five agricultural market centers in Central Luzon. Besides questions on number employed, the establishments were asked how many of their customers were farmers. Some *preliminary* results from his study appear in Table 5.38. It will be noted here that employment in retail of traditional and non-traditional goods and services, manufacturing for household items, light transport, housing components, construction, etc. increased by about 78 percent in Gapan and 81 percent in the rural towns during the 1967 to 1971 period. The increase in these types of employment was much higher than that in agricultural inputs, processing and trading and heavy transport and machinery-related establishments which reported only 16 and 14 percent increase for Gapan and rural towns, respectively. These findings indicate that increases in farm income result in expanded purchasing power and therefore a greater demand for goods and services which could now be afforded. Although the evidences linking productivity, consumption and expansion of employment opportunities in meeting the demands for goods and services have to come from a variety of sources, the linkages advanced by Gibb appear plausible. Farm and household surveys provide the productivity, consumption and aspiration aspects reflecting increased demand for goods and services. When one has seen the before-after (1967-1971) conditions in the surrounding rice farming households and villages, the links become more obvious. Among the most conspicuous are the tricycles plying the routes from town to village and the improvements in housing and home furnishings. Gibb reports that the tricycles were mostly owner-operated by farmers' children. As mentioned in another chapter, Gapan farmers reported increases

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[27] G. T. Castillo, et al., The Green Revolution at the Village Level, *op. cit.*; R. T. Herrera, *op. cit.*; J. C. Stewart, *op. cit.*; T. E. Contado and R. Jaime, *op. cit.*

[28] Arthur Gibb, Jr., Report on On-Going Research: Some Evidence on the Impact of Agricultural Modernization on Non-Agricultural Incomes in Agricultural Market Centers. Institute of Economic Development and Research, School of Economics, University of the Philippines, Discussion Paper No. 72-4, April 11, 1972.

Table 5.38. Labor absorption in non-agricultural activities in the Gapan-area, Nueva Ecija Province.

	Gapan Employment		% Increase (1967-71)	Rural Towns Employment		% Increase (1967-71)
	No.	%		No.	%	
COMMERCE AND SERVICES	753	21	46	495	20	43
Retail; Traditional Goods/ Services	428		41	282		48
Retail: Non-traditional Goods/Services	68		42	11		120
Personal and Recreational Services	257		58	202		34
MFR. FOR HOUSEHOLD CONSUMPTION	487	14	170	337	14	47
Manufacture for Local Demands	158		93	139		25
Manufacture for Regional Demands	329		234	198		66
LIGHT TRANSPORT RELATED GROUP	653	18	140	454	18	274
Tricycles, Jeeps, Light Repair Shops	653		140	454		274
HOUSEHOLD INVESTMENT RELATED	428	12	24	214	9	65

Table 5.38 (Continuation)

	Gapan Employment No.	%	% Increase (1967-71)	Rural Towns Employment No.	%	% Increase (1967-71)
Secondary Education (Teachers)	71		25	94		49
Housing Components & Furnishing Mfr.	68		74	39		70
Construction Materials Mfr./Supply	152		6	51		76
Construction Contractors	137		29	30		100
Total A	(2,321)	(65)	(78)	(1,500)	(61)	(81)
PUBLIC SERVICES	677	19	28	632	25	18
Governments	241		5	148		20
Primary Education (Teachers)	321		34	406		15
Medical Services	70		125	54		23
Utilities, etc.	45		67	24		41
Total B	(677)	(19)	(28)	(632)	(25)	(18)
AGRI. INPUTS, PROCESSING & TRADING	434	12	31	284	11	49
Agricultural Implements & Supply	28		75	3		–
Rice Milling and Trading	399		29	268		46
Palay Traders & Independent Truckers	7			13		–

Table 5.38 (Continuation)

	Gapan Employment No.	%	% Increase (1967-71)	Rural towns Employment No.	%	% Increase (1967-71)
HEAVY TRANSPORT & MACHINERY RELATED	118	4	51	71	3	37
Mfr. Maintenance/Repair Firms	118		51	71		37
Total C	(552)	(16)	(35)	(355)	(14)	(41)
GRAND TOTAL	3,550	100	58	2,487	100	54

Source: Arthur Gibb, Jr., from a seminar given at the IRRI on June 15, 1972.

in food consumption, purchase of household items, and educational expenses which they attribute mostly to increases in farm income and partly to non-farm income.

Again, the Gibb study tells us that the employment and income distribution effects of the new rice technology are not confined to direct labor input in rice production. If the new rice technology has brought about increased yields and increased incomes and if the latter have stimulated consumption and a greater demand for goods and services, then there is an indirect employment effect from the new rice technology.

H. The Manpower Dilemma in Rice Production

One of the fears generated by the advent of the new rice technology is that labor-saving devices would come into greater use and human labor would be displaced. When we reckon the size of our labor force in aggregate terms, we arrive at the conclusion that we need to promote labor-absorbing activities in order to offset unemployment. Setting aside this macro-level view, the anthropologist proceeds to examine in depth the manpower situation in rice production as it is practiced in a particular place. Using intensive time and motion study for a close-up view of actual work performance in a rice-growing village, Jamoyawon in Siargao Island, Northeastern Mindanao, Sodusta concluded that labor resource for rice production is inadequate due to the shortage of "qualified" skilled workers.[29] Three major reasons account for this shortage: (1) There is a *high percentage of children among the village population.* The community's definition of a qualified worker is one who is at least 15 years of age in order to meet physical requirements for land preparation, repair of sluices, etc. Based on this criterion alone, out of 768 barrio population, only 423 workers or 55 percent are "qualified" to engage in rice cultivation. This means about 5 persons per hectare for the 84 hectares of rice lands during the first crop and 9 persons per hectare for the 45 hectares cultivated for the second crop. A household may have seven members but five could be children all below 15 years of age. As a matter of fact, only 20 percent of the peasants receive assistance in farm work from their own households. Land preparation, the most arduous task of all, is left practically to the peasant himself or to a

[29]Jesuscita Sodusta, Manpower and Wet Rice Cultivation in Jamoyawon, Siargao Island, Northeastern Mindanao, 1973.

hired hand. (2) The available labor force is engaged in a variety of household and other "nonproductive" activities which compete with the time and labor required for rice production but which are essential to everyday life. The wife, for example, is almost completely occupied with doing the household chores and attending to the children. The children are in school or helping in these chores. Older children are either working elsewhere or are married and, therefore, have their own households to care for. The seasonality of rice production makes them look for other jobs, hence they cannot be depended upon to be around to perform farming operations. The simultaneous demand on the farmer's time and energy results in irregular work schedule which has repercussions on agricultural production. This also affects the continuity of input in the rice field by the same worker. (3) Majority of the labor force are undernourished or malnourished. The adult members of the household lack the energy and vigor needed for intensive muscular work. Table 5.39 shows the calorie deficiency which exists among 11 peasants whose food intake was analyzed in relation to nutritional requirements. A physical examination also showed evidences of calorie-protein malnutrition as shown in the form of chronic tuberculosis, nutritional anemia, simple goiter, beriberi and scurvy. Stunted growth was observed among children. In some instances, gastro-intestinal parasites aggravate the calorie-protein deficiency.

Because life must go on for the peasant, adjustments to the labor and energy shortage in rice production are made in the following manner:

(1) *Four or five carabaos are used for land preparation.* This alternative may not be available for long because of the declining carabao population. Nearly 50 percent of the peasants have to borrow an animal to prepare their land for planting. As a solution to the "farm power" shortage, the carabaos do not offer a good answer because much time and energy is spent in taking care of them (Table 5.40). Of all the activities engaged in by the peasant, caring for this work animal occupies most of his time.

(2) *The different stages in land preparation are combined, shortened or omitted in order to save time and labor.* Such short cuts lead to inadequate land preparation, luxuriant growth of weeds, while leaving unharmed a sufficient number of micro-organisms vital to the decay of plant residues. Thus an ecological balance is achieved which

Table 5.39. Anthropometric measurements, recommended daily allowance and calorie deficiency of 11 Jamoyawon peasants.

Peasant No.	*Age*	*Height (ft.)*	*Weight (lbs.)*	*Ideal body weight*	*Basal calories*	*Food allowance*	*Ave. calorie intake per day*	*Calorie Deficiency*
1	64	4'11"	95	99	1180	1980	909	107
2	42	4'11"	95	99	1230	2090	1113	977
3	48	5'4"	127	124	1420	2400	1005	1395
4	35	5'1"	104	109	1350	2250	966	1284
5	32	5'5"	128	129	1520	2600	846	1754
6	45	5'3"	118	119	1400	2375	960	1415
7	55	5'5"	130	129	1420	2400	768	1632
8	23	5'8"	125	144	1730	2910	1808	1022
9	28	5'3"	110	119	1510	2550	900	1650
10	38	5'21/2"	116	116	1380	2346	972	1372
11	27	5'2"	105	114	1465	2475	954	1521

Source: J. Sodusta, *op. cit.*

enables the peasants to obtain some harvest without using fertilizer, hardly any weeding, and practically no insecticides although they use IR-5.

To illustrate the short cuts resorted to in land preparation, Sodusta interviewed the peasants as to how much time was involved in each stage. Having obtained such information, she proceeded to make direct observations of the actual procedures followed. As she discovered, data obtained from the interviews represented what peasants consider as the "ideal" way of preparing land. Their actual practice deviates considerably from their ideal as a means of adjusting to the labor problem. Table 5.40 shows that ideally, land preparation takes a total of 27-1/2 days. In practice, only 7 days were spent, with the first three stages shortened and the last two were eliminated. Needless to say, this system of land preparation is very inadequate.

Table 5.40. Data on time spent by peasants on land preparation obtained from interviews and from direct observation.

Data from interview 10,000 sq. m. area No. of plots: 20 No. of animal resources: 4-5	Data from direct observation 8,552 sq. m. area No. of plots: 21 No. of animal resources: 4
Five stages in land preparation	
1. *First tillage* (one to 2 weeks, then fallowing takes place)	1. 9 hours and 25 minutes
2. *Second tillage* about one week	2.) 12 hours then transplanting follows
3. *Puddling* 4 to 5 days	3.)
4. *Levelling* 2 days	4. not practiced
5. *Ironing* 1/2 day, then transplanting follows	5. not practiced
Average No. of hours worked per day: 5 hrs.	3 hours, 3 minutes and 34 seconds
Total work days spent: 27 1/2 days	7 days

Source: J. Sodusta, *op. cit.*

(3) To cope with the energy requirement in land preparation, considering calorie-protein deficiency, the peasant spends

much time sitting idly between tillage activities and taking a nap or resting (Table 5.41). These two activities combined come next to taking care of carabaos as most frequently engaged in by 11 peasants for the 55-day period of the second crop.

After this intensive time and motion analysis of work in rice production, Sodusta expresses misgivings about the present preoccupation with multiple cropping as an answer to what is defined aggregatively as a labor-surplus problem. Sodusta's findings may be reinforced in other places if repeated because farmers often complain about lack of farm hands as a reason for not performing certain recommended farm practices. Casual observations at the village level also confirm the health and nutrition problem of farm workers. Given these realities of low productivity due to low energy input, how does one break the vicious cycle? Labor-saving rather than labor-absorbing practices seem to be called for. How does this relate to the mechanization and labor displacement issues in employment? Here we see the discrepancies in the implications of macro- and micro-level studies on the manpower problem. As Sodusta suggests: "The numerical size of the household is a poor indicator of the strength of the household." In the same vein, the size of the labor force is an inadequate indicator of effective manpower for agricultural production.

Table 5.41. Activities performed by Jamoyawon peasants during the second crop for 55 days.

Peasant No.	Number of activities																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	186	27	4	2	1	0	0	21	10	1	0	2	0	2	0	7	52	1	0	3	5	0	6	0	0
2	55	43	8	5	1	0	0	0	2	0	15	4	0	3	0	3	42	10	0	5	0	0	10	0	0
3	7	11	6	8	2	4	0	8	0	0	6	7	0	1	4	50	5	5	0	1	29	0	8	0	1
4	44	30	1	6	0	0	0	4	0	0	0	0	0	0	2	6	40	15	0	8	4	0	1	0	1
5	62	15	0	2	3	0	0	0	10	11	9	2	2	18	2	23	17	20	0	0	6	0	12	0	0
6	82	54	2	13	0	2	0	13	1	0	0	0	0	1	0	44	7	0	0	1	20	0	0	0	3
7	81	27	3	17	1	6	0	3	5	2	2	1	0	15	0	20	16	0	0	0	15	0	2	0	0
8	163	40	3	12	6	1	0	2	11	13	8	1	0	6	8	46	24	0	10	0	5	0	0	0	4
9	67	36	1	11	3	0	0	0	1	1	0	0	0	15	12	21	9	0	10	0	0	0	0	0	1
10	98	40	1	0	3	0	0	4	2	2	12	2	0	29	2	56	31	6	0	2	18	0	7	0	2
11	30	40	9	15	16	0	0	6	16	43	59	0	1	14	1	62	24	10	0	1	6	0	10	0	2
TOTAL	875	363	38	91	36	13	0	61	56	73	111	19	3	104	31	338	267	67	20	21	108	0	56	0	14

Code for Activities:

1. Transferring, grazing carabaos
2. Land preparation
3. Pulling, transplanting seedlings
4. Regulating water in the field
5. Weeding
6. Spraying insecticides
7. Performing rice ritual
8. Household chores
9. Pounding palay
10. Fetching water
11. Making copra
12. Preparing meal
13. Washing clothes
14. Chopping firewood
15. Picking vegetables
16. Sitting idly
17. Taking a nap, resting
18. Gathering root crops
19. Playing basketball
20. Clearing field, forest
21. Going to other barrios
22. Going to school
23. Repairing house, building fence
24. Sewing clothes
25. Going to church

Source: J. Sodusta, *op. cit.*

6

The Philippine Land Reform Program and the New Rice Technology

On August 8, 1963, Republic Act 3844, otherwise known as the Agricultural Land Reform Code was passed with the major objectives of "effecting land tenure reform, to improve the general welfare, and to increase the income of the farmers through the improvement of their productive capabilities."[1]

According to Sacay, the land reform program was instituted to increase the production of food and commercial crops by modifying the way land resources are utilized. The Code adopted a land-use policy aimed at intensifying the cultivation of 7.5 million hectares of cultivated land primarily to increase food production and at developing the 2.2 million hectares of undeveloped land into large-scale plantations primarily to increase commercial crop production for domestic manufacture and export. The two phases of the land reform program included the abolition of share tenancy and the establishment of a leasehold system and the transfer of landownership to the cultivator. As a consequence of the program, it was expected that landlord capital would be channeled into industry. On the argument that share tenancy status is a reflection of financial condition which like poverty cannot be abolished, Sacay provides the following justifications:

(1) Share tenancy does not lend itself to providing the incentives so necessary for increased production. If the farmer has to share the increment in production with the landowner, he has little incentive to work harder. Such would also be the case where farmers entirely provide expenditures for tools, equipment and other production inputs. In a leasehold system, rental for the use of land is

[1]Pedro R. Sandoval and B. V. Gaon, Agricultural Land Reform in the Philippines: Economic Aspects, UPCA, 1971, p. 7.

fixed (25% of the past three normal harvests) and, therefore, increased production through better management, harder work and larger capital investment entirely accrues to the farmer.

(2) Share tenancy nourishes paternalistic tendencies among farmers and as has been previously proven, credit and agricultural extension efforts have almost always been ineffective in high tenancy areas. This is attributed to the fact that share tenants have not had the opportunity to become "independent, self-reliant individuals and to develop better managerial skills necessary for increased production and income."

(3) Associated with share tenancy is the prevalence of usurious credit practices. Although sharing arrangements may in fact be fair, a significant proportion of the share of tenants is claimed by landowners in the form of credit charges.

(4) Share tenancy is a manifestation of the poor financial position of the farmers and is also a manifestation of the existing social structure. In 1903 the percentage of tenancy was 19 percent and in 1963, this increased to 39 percent.

In view of the above reasons, the Land Reform Code was to serve as the instrument for the abolition of share tenancy. However, under the first phase of the land reform program, the operations must not only "fill the vacuum created by the withdrawal of landowner participation in the production process but must also provide the necessary support and services to insure an increase in productivity and income."[2]

Ruttan assessed this Code with optimism, for it sharply departs from previous legislation in the sense that there is important emphasis placed on both equity and productivity objectives and program instruments. He describes the document as bearing the "unmistakable imprint of a group of young economists and intellectuals who were primarily concerned with the failure of existing agricultural development program to generate sufficiently rapid gains in agricultural productivity to match the rapid population growth rate . . . The productivity orientation of the legislation was particularly useful in gaining the support of the growing industrial classes that would not have been swayed by

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[2]O. J. Sacay, The Philippine Land Reform Program, *Phil. Econ. Journal* No. 4, Second Sem., 1963, Vol. II, No. 2, pp. 169-183.

political appeals for equalitarian justice for the peasantry during a period when organized rural unrest was apparently dormant."[3]

Tavanlar, who was Chairman of the Presidential Land Tenure Committee during the Magsaysay Administration when emphasis was more on land distribution and resettlement, underscored recently that "the success of an agrarian reform program depends on the introduction of modern and improved agricultural practices and inputs which enable the farmer to derive the most income from his plot of land . . . To those who contend that land reform should bestow landownership to the tiller to give him human dignity, my reply is I agree. But let us remember also that human dignity is attained by most farmers of the world, not by landownership but by being successful farmers."[4]

The new rice technology's role in the land reform program depends on the extent to which it has been harnessed as an ingredient in the pursuit of the productivity objectives and the consequences of such an application. An assessment of its independent role apart from the institutional setting is, therefore, virtually impossible, hence the need to present the various aspects of the tenancy situation.

Given these expressed objectives and hopes for Philippine land reform, this portion of the analytical review presents results of studies relevant to:

(a) Patterns and scope of tenancy
(b) Some general characteristics of landlords and tenants
(c) Landlord-tenant response to the Land Reform Program
(d) Landlord-tenant role perceptions and expectations
(e) Landlord-tenant patterns of decision-making
(f) Tenure status, farm size, productivity and innovativeness
(g) Land reform in the *New Society*

A. Patterns and Scope of Tenancy

In a predominantly agricultural country where wealth is reputed to be unevenly or inequitably distributed, landownership and tenancy questions are very politically salient. As a matter of fact,

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[3]V. W. Ruttan, Equity and Productivity Issues in Modern Agrarian Reform Legislation. Paper presented at the International Economics Association Conference on the Economic Problems of Agriculture, Rome, Sept. 1-8, 1965.

[4]Eligio J. Tavanlar, Land Reform in the Philippines, *Manila Chronicle,* March 4, 1971, p. 16.

attempts at land reform are a reflection of this preoccupation. To provide an objective basis for viewing the tenure situation, Table 6.1 presents data on farms by types of land tenure as of 1960. It should be pointed out that more than half of the 2,166,216 farms and about two-thirds of the total farm land area were fully and partially owned. Only 40 percent of the farms and 26 percent of the area were tenanted. Of the 864,538 farms under tenancy, 86 percent were operating on a share of produce arrangement (Table 6.2). In rice farming, tenancy which is about 48.1 percent of the total number of farms, is concentrated in the Central Luzon provinces where the incidence of dissident activities in the past had always been associated with the high tenancy rate.

Table 6.1. Number and area of farms by types of land tenure, Philippines, 1960.

Tenure	*Type of land tenure*		*Land area*	
	Number of farms	*Percent of total*	*Area in hectares*	*Percent of total*
Full owner	967,725	44.67	4,133,276	53.17
Part owner	310,944	14.36	1,139,956	14.67
Tenant	864,538	39.91	2,000,201	25.73
Manager	2,487	0.11	365,309	4.70
Other forms of tenure	20,522	0.95	133,742	1.73
Total	2,166,216	100.00	7,772,484	100.00

Source: *Census of the Philippines: 1960 – Agriculture,* Vol. II, Summary Report, pp. 8-9. Bureau of the Census and Statistics, Republic of the Philippines, Manila.

Table 6.2. Number and area of farms by type of tenancy, Philippines, 1960.

Tenure	*Type of land tenure*		*Land area*	
	Number of farms	*Percent of total*	*Area in hectares*	*percent of total*
Cash	13,500	1.56	47,008	2.35
Fixed amount of produce	34,145	3.95	88,911	4.45
Share of produce	745,426	86.22	1,677,857	83.88

Table 6.2 (Continuation)

Tenure	Type of land tenure		Land area	
	Number of farms	Percent of total	Area in hectares	Area in percent of total
Cash & fixed amount of produce	693	0.08	3,676	0.18
Cash & share of produce	10,847	1.25	34,083	1.70
Rent free	29,816	3.46	55,918	2.80
Others	30,105	3.48	92.748	4.64
Total	864,538	100.00	2,000,201	100.00

Source: *Census of the Philippines: 1960 – Agriculture,* Vol. II, Summary Report, pp. 8-9, Bureau of the Census and Statistics, Republic of the Philippines, Manila.

Data in Table 6.3 show the total rice farm area in Central Luzon and how they were distributed by tenure as of 1960. The highest percentages of share-tenanted area were in Pampanga (72%) and Nueva Ecija (57%) with Bulacan (50%), Tarlac (49%) and Pangasinan (38%) following in descending order. Conversely, Pangasinan and Bulacan had the largest portions of rice land under full owner-operators. For the five provinces of Central Luzon, more

Table 6.3. Distribution of farm area by tenure operator in five provinces in Central Luzon (May, 1960).

	Bulacan	Nueva Ecija	Pangasinan	Pampanga	Tarlac	All Philippines
	–Percent–					
Full owner	20.5	15.9	28.1	5.4	18.3	53.2
Part owner	15.2	9.1	26.0	6.3	15.7	14.7
Tenants: all types	60.7	61.1	43.2	81.3	55.8	25.7
Cash tenants	0.6	1.7	0.8	1.2	0.5	0.6
Fixed amount of produce	7.1	1.5	2.1	5.3	3.8	1.1
Share of produce	50.4	56.6	38.2	72.2	48.7	21.6
Mixed types of the above	2.6	1.2	2.2	2.6	2.8	2.4
Manager	2.6	12.8	2.4	5.3	5.8	4.7
Other forms of tenure	1.1	1.2	0.2	1.6	4.4	1.7
Total area of farms in hectares	100.0 74,636	100.0 217,730	100.0 84,879	100.0 168,701	100.0 115,371	100.0 7,772,485

Source: *Census of the Philippines, 1960-Agriculture:* Summary Report, Vol. II, p. 9 (Cited in Shigeru Ishikawa, Agricultural Development Strategies in Asia: Case Studies of the Philippines and Thailand, Asian Development Bank, 1970).

than half of the rice area was under share tenancy. Less than a fifth was fully owned and one-sixth, partly owned.

With respect to farm size distribution in 1960 for the country, out of a total 1,041,882 rice farms, 1,042 (0.1%) were larger than 200 hectares and 4,688 were over 50 hectares (0.5%). Farms over 500 hectares accounted for 373,985 hectares out of a total hectarage of 3,112,131 (12% of the area). The most number of rice farms (330,667 or one-third) were from one to two hectares in size; the second most numerous (24%) were from two to three hectares (249,412).[5] Table 6.4 shows that the average rice farm is 3 hectares; farms of 10 and above make up 20 percent of the total area of rice farms and farms larger than 200 hectares make up only 2 percent.

To illustrate this farm size and area distribution, the case of Tarlac province in Central Luzon is presented below.[6] A picture of the farm size distribution such as that of Tarlac shows that farm size is not as inequitably distributed as landholdings, with 60 percent of the rice land in farms between one to 5 hectares and 80 percent of the farms belonging to this category. Hundred-hectares farms are only .07 percent of the total number and 7 percent of the land. However, the picture of landownership may be another matter. Small farm size with an average of about three hectares is partly a consequence of owned land being distributed for tenant operations, each of which is regarded as a separate farm. Hence, a 100-hectare piece of rice land owned by one family could realistically be divided into at least 30 farms being cultivated by 30 tenants.

To illustrate the phenomenon of concentration of land ownership, Table 6.5 presents the extent of landholdings attributed to

Farm Size in Hectares	*No. of Farms*	*Area*
0 – 1	1,706	763.2
1 – 3	18,753	32,906.0
3 – 5	10,255	36,259.0
5 – 15	4,659	31,216.9
15 – 25	132	2,395.4
25 – 100	74	3,333.8
100 – 200	17	2,111.3
200 and above	10	6,385.8
Total	35,606	115,371.4

[5] USAID, Land Reform in the Philippines, Manila, 1971, mimeographed, 93 pp.

[6] Ibid.

Table 6.4. Average farm area for major Philippine crops.

Crop	*Farms (number)*	*Area (hectares)*	*Average Size of farms (hectares)*	*Percent of total area in*	
				Farms of 10 hectares or over	*Farms larger than 200 hectares*
All farms	2,166,200	7,772,500	3.6	33	8
Sugar cane	17,800	249,400	13.9	80	43
Abaca	36,000	209,000	5.8	49	8
Coconut	440,300	1,938,600	4.4	38	3
Palay	1,041,900	3,112,100	3.0	20	2
Corn	378,800	949,300	2.5	20	1
Tobacco	22,900	38,400	1.7	8	0

Source: Frank H. Golay and Marvin E. Goodstein, Rice and People in 1990, Table 7, p. 14. Manila, 1967, (Based on 1960 Bureau of the Census and Statistics figures).

100 landowners in Bulacan and Nueva Ecija. Almost 60 percent of the total hectarage of landholdings belong to the upper ten landowners. The largest landholding which is 3,741 hectares already comprises 30 percent of the total area. In this situation, the distribution of landowners according to size and the computed average would be both misleading. The former shows that almost half of the landholdings are 40 hectares and below and the latter shows that the average size of land owned is 123 hectares. Both conceal the concentration of landownership in the hands of a few landowners.

Griffin criticizes farm size data presentation in Philippine studies because "it is virtually impossible to detect the degree of inequality in the distribution of landed wealth. The data are organized according to the size of the operational unit, and since most landowners – particularly in the rice growing regions – break up their estates into a large number of small tenant farms, a size distribution of farms gives a misleading impression of equality. Farm sizes may be equally distributed; farm ownership is not."[7]

The use of operational farm-size data rather than size of landholdings arises from the fact that size of land area being

[7]Keith Griffin, Economic Aspects of Technical Change in the Rural Areas of Monsoon Asia, *op. cit.*

Table 6.5. Size of landholdings of 100 riceland owners in Bulacan and Nueva Ecija, 1965.

Landowners grouped by decile	*Range of size of landholdings in hectares*	*Percent of total area of landholdings*	*Size of landholdings*	*Percent of landowners in each size category*
1 – 10	3 – 14	0.82	20 & below	19
11 – 20	15 – 21	1.46	21 – 40	29
21 – 30	21.5 – 28.5	2.06	41 – 60	12
31 – 40	30 – 33	2.54	61 – 80	8
41 – 50	33 – 42	3.04	81 – 100	7
51 – 60	43 – 59.5	4.12	101-120	6
61 – 70	63.33 – 93	6.10	121 – 140	3
71 – 80	95 – 116	8.14	141 – 160	2
81 – 90	120 – 216.73	13.10	161 – 190	1
91 – 100	227 – 3741	58.32	191 – 300	1
			396	1
			420	1
			462	1
			792	1
Total	12316.55		3741	1
			Total 12316.55	

Source: Data from E. Bernal-Torres, University of the Philippines, College of Agriculture.

cultivated can easily be obtained from the farmer-cultivator himself. Research on size land owned has been handicapped for at least two reasons:

(1) How does one determine ownership of land? Is it by legal papers of possession or by virtue of whoever has responsibility for looking after the land? Many pieces of land are fuzzy with respect to ownership.

(2) Is the land conjugal, individual, communal or family property? A family of eight children which has total landholdings of 100 hectares may be considered a big landowner as a family but if the property has been divided among eight children, it is not such a big holding, especially if this means eight separate nuclear families.

The definition, identification, and actual counting of landowners and their holdings are, therefore, a very practical problem which doubtless has been among the bottlenecks in the land reform program, especially when land ceilings and expropriation proceeding are involved. As a matter of fact, this problem of landownership directly affects the decision as to who the respondent ought to be in a landlord study, particularly when the land is held by a family. One needs to know who is the major decision-maker in the family with respect to the land. This constitutes a study in itself.

Before Bernal's study was conducted in 1965, there had been no attempt at systematically obtaining data on landlords in the Philippines. Among the reasons she cited for this lack were: (1) the highly fragmented nature of landholdings; (2) the system of property transfer which in most cases is mere verbalizations of arrangements, hence the utter lack of formal records or contracts; (3) possibly there are underdeclarations of total landholdings to the extent that "dummy" owners are thought to exist. In the course of her own study, Bernal encountered names in land tax records which were of those persons who were deceased, had sold the land, left the place, were completely unknown or had fictitious addresses. In many cases, the official records were completely useless, hence greater reliance was placed on local residents' knowledge as to who the landlords were. In addition, knowledgeable tenants, overseers, and neighbors were also sought out for further information, particularly on sizes and whereabouts of holdings. As Bernal describes it: "Just to trace the whereabouts of respondents (landlords) had been a challenge short of being a real detective work."[8]

All these, however, do not invalidate the point made by Griffin.

Since the first phase of the land reform program aims at the abolition of share tenancy, data on this have direct implications for program operations. Table 6.6 indicates that program coverage as of 1967 in relation to total number of share tenants and area farmed is rather low even in the Priority I provinces of Central Luzon. Only about one-fifth of the tenants and a fourth of the area come under their program. In the lower-priority areas, the proportions are as low as three percent of tenants in Mindanao. It should also be noted that the average area farmed per tenant is only about 2.24 hectares with the Ilocos Region and the Visayas reporting much smaller farms.

[8]E. A. Bernal, The Role of Landlords in Philippine Agricultural Development: An Exploratory Study. Unpublished M. S. Thesis, University of the Philippines, College of Agriculture, 1971.

Table 6.6 Total scope of work for conversion of share tenants to leasehold and other pertinent data as of June, 1967.

Region	No. of prov.	No. of municipalities	Total No. of share tenants	Total area farmed (hectares)	Area farmed per tenant	Percent scope of program which are under tenants	Percent scope of program area	Priority
I	6	190	59,537	86,398	1.45	14.60	9.47	4
II	4	76	29,528	75,548	2.56	7.24	8.27	6
III	6	120	88,509	239,117	2.70	21.72	26.19	1
IV	10	210	60,659	136,260	2.25	14.88	14.92	3
V	6	111	34,500	71,160	2.06	8.46	7.79	5
VI	5	123	73,261	161,900	2.21	17.97	17.74	2
VII	6	242	25,247	49,106	1.95	6.19	5.38	7
VIII	8	156	13,376	32,039	2.40	3.28	3.51	9
IX	5	115	23,082	61,477	2.66	2.66	5.66	8
TOTAL	56	1343	407,699	913,005	2.24	100.00	100.00	

Region I — Pangasinan, Ilocos Norte, La Union, Ilocos Sur, Abra, Mountain Province
Region II — Cagayan, Batanes, Isabela, Nueva Vizcaya
Region III — Tarlac, Nueva Ecija, Pampanga, Bulacan, Bataan, Zambales
Region IV — Rizal, Laguna, Quezon, Batangas, Marinduque, Cavite, Mindoro Oriental, Mindoro Occidental, Romblon, Palawan
Region V — Camarines Norte, Camarines Sur, Catanduanes, Albay, Sorsogon, Masbate
Region VI — Iloilo, Antique, Capiz, Aklan, Negros Occidental
Region VII — Negros Oriental, Cebu, Bohol, Leyte del Norte, Leyte del Sur, Samar
Region VIII — Bukidnon, Misamis Oriental, Lanao del Norte, Lanao del Sur, Zamboanga del Norte, Zamboanga del Sur, Misamis Occidental, Sulu
Region IX — Cotabato, Davao, Agusan, Surigao del Norte, Surigao del Sur

Source: *Land Reform Leasehold Operations: A Four-Year Program 1968-1972,* Office of the President, National Land Reform Council, Diliman, Quezon City.

Table 6.7 shows the over-all scope of land reform as of May, 1971 which included only a third of the provinces, a sixth of the municipalities and about a fourth of the rice area and rice farmers. Although this looks like an improvement over the 1967 figures, there is no question that the actual scope is still much below the expectations. An interesting development was Camarines Sur, Bicol Region, where in 1971 leasehold was supposedly operational in 37 municipalities and six Land Reform Project Teams were fielded.[9] In 1967, the Bicol Region was of fifth priority but in 1971 Camarines Sur had more municipalities under coverage than any of the provinces in Central Luzon. This is significant in the light of the reported take-over by 300 members of the Bicol Landless Tenants Association (June 18, 1972) of a 40-hectare portion of the Soler Estate. The legal officer of the land reform office in the area reported in December 1971 about farmers' restlessness and threat to enter the property unless the Estate was expropriated. This Soler Estate was composed of three parcels totaling 2,000 hectares.[10]

Table 6.7. Scope of coverage of land reform operations as of May 1971.

	Total scope Philippines	*Present coverage*	*Percent of coverage of total scope*
1. No. of provinces	66	20	30.3
2. No. of cities, municipalities and municipal districts	1,506	236	15.7
3. Land resources (hectares)			
Total land area	30,000,000	3,700,525	12.3
Total farm area (all types)	7,772,484.6	1,279,328.5	16.5
Total rice area	3,038,502.1	718.812.5	23.7
Total corn area	952,970.4	69,139.4	7.2
4. Human resources			
Total population	37,008,419	6,753,348	18.2
Total farm population	12,668,250	2,261,766	17.8
Total rice farmers	1,061,333	292,469	27.6
Total corn farmers	382,558	22,563	5.9

Source: *Agrarian Reform: To Fulfill a National Dream.* The National Media Production Center, Aug. 8, 1971 (Cited in P. R. Sandoval and B. V. Gaon, *op. cit.*)

[9]The National Media Production Center, Agrarian Reform: To Fulfill a National Dream, Aug. 8, 1971.

[10]Zenaida Babao, "Bicol Farmers Seize Portion of Soler Land," *MT,* June 19, 1972,

For a rough single indicator of the vigor with which Land Reform operations have been pursued, Table 6.8 presents the financial investments which had been made from 1964 to 1971. One of the most notable features in this table is the great discrepancy between the authorized appropriations and the actual obligations. The latter ranged in magnitude from 12 to 34 percent of what had been authorized. It is, therefore, misleading to gauge performance against authorized appropriations. There had been an over-all increase in actual obligations made to the seven integrated agencies from almost 32 million pesos in 1964 to 55 in 1967, 58 in 1968 and 74 in 1970. By 1971, the amount had declined to 52. Of more direct relevance to the new rice technology because of their promotional and supportive role toward its effective adoption are the Agricultural Productivity Commission (APC) and the Agricultural Credit Administration (ACA). The amounts obligated to APC remained practically at the level of 13 million pesos except in 1966 and 1967, when these reached about 18 million. The allocations to ACA were very erratic in magnitude, ranging from one million in 1966, increasing to 16.5 million in 1967, almost 13 million in 1968 and 15 million in 1969 and reaching an unusually high figure of about 23 million in 1970 but dropping to 6 million in 1971. Other things being equal, one would expect that with increased expenditures, there would be greater farm level support for improving productivity. Of the seven agencies, the Land Bank had minimal or no support for four years even in 1964 when program implementation started.

On the relationship between farm size and ownership, the case of two barrios, Sinayawan and Beynte Nuwebe, in the municipality of Hagonoy, province of Davao del Sur provides village-level insights. While the average farm sizes in the two villages are 1.83 and 1.79 hectares, respectively, the tenancy rates are 86.3 and 92.4 percent. The rest are owner-operators. These rates are very high, considering that theoretically, tenancy should not exist in these areas where land was supposed to have been acquired by individuals who would themselves cultivate the land. As a mater of fact, Davao and Cotabato belong to Region IX which is next to the last region in terms of priority for land reform. But as Stewart describes it:

> . . . "much of the land in Hagonoy was acquired in parcels of 24 hectares under the Homestead Act. In many cases this land has since been divided for purposes of sale or inheritance. Today the 137 hectares of irrigated riceland in Beynte Nuwebe are owned by 15 individuals whose average size of holding is 9.14 hectares. In Sinayawan, 383 hectares are owned by 76

Table 6.8. Total authorized appropriations and actual obligations for agencies created under Rep. Act. 3844 (Land Reform Law)

Integrated agencies	*1964*		*1965*		*1966*		*1967*		*1968*		*1969*		*1970*		*1971*	
	Auth.	*Actual*	*Auth.*	*Actual*	*Auth.*	*Actual*	*Auth.*	*Actual*	*Auth.*	*Actual*	*Auth.*	*Actual*	*Auth.*	*Actual*	*Auth.*	*Actual*
	IN MILLION PESOS															
Land Authority	31.32	9.01	32.5	16.39	32.10	13.08	19.07	12.76	16.76	17.58	25.36	19.00	30.35	21.44	31.20	25.39
Agricultural Productivity Commission	22.31	13.69	17.62	14.14	18.33	17.69	18.62	18.17	20.13	12.59	13.69	12.94	15.57	12.86	17.20	13.64
Office of Agrarian Council	3.26	0.44	1.73	1.10	1.73	1.52	1.77	1.33	2.24	1.43	2.36	1.61	3.35	2.31	4.12	2.45
Agricultural Credit Administration	10.00	6.00	2.50	2.50	1.00	1.00	17.58	16.58	13.96	12.96	36.37	15.00	45.00	22.75	24.79	6.00
Court of Agrarian Relations	2.28	2.28	3.70	2.77	3.97	3.58	4.10	3.85	40.06	4.03	4.66	4.75	4.99	5.30	5.39	4.38
Agric. Tenancy Commission	0.53	0.35	0.53	0.37	0.53	0.48	0.47	0.46	0.48	0.43	0.54	0.47	0.55	0.51	0.65	0.50
Land Bank	201.00	–	102.00	0.20	102.30	–	103.00	2.00	102.8	–	104.8	5.00	114.80	9.13	104.80	–
TOTAL	270.70	31.78	160.58	37.40	160.01	37.35	164.51	55.06	160.43	49.02	187.79	58.76	214.62	74.29	188.15	52.35
Actual Authorized		12%		23%		23%		34%		30%		31%		34%		28%

Source: Progress Report. Plans and Programs Office, National Land Reform Council, Quezon City, June 30, 1971. (This Table was adopted from Sandoval and Gaon, *op. cit.*, Appendix Tables 4 to 11.)

individuals whose average holding is 5.04 hectares. However, more than 100 hectares of this land are presently submerged due to poor drainage and have been abandoned. These averages tend to obscure the concentration of ownership. In Beynte Nuwebe, five individuals with holdings of 20 hectares or more own nearly 80 percent of the land. In Sinayawan, eleven individuals whose average holding is 16.3 hectares own nearly half of the land."[11]

On the other hand, the changing tenure situation in Gapan, Nueva Ecija, a high priority land reform area in Central Luzon, gives some reason for optimism. In the 1960 Census, Gapan was reported to have 87 percent of farmers as share tenants. In 1969, about 45 percent, or 1065 out of 2232, were share tenants. A study of three villages in the municipality yielded the following figures:[12]

	Mahipon	*Malimba*	*San Nicolas*
Leasehold	46%	26%	23%
Share tenants	26%	59%	57%
Owner-operators	25%	6%	16%
Part-owners	3%	9%	4%

For the province of Nueva Ecija, an Institute of Philippine Culture study estimated the total number of rice farmers to be 70,800, distributed as follows: 8,200 owner-cultivators (11%); 28,900 lessees (41%); 26,100 share tenants (37%); 4,800 part-owners (7%); and 2,800 lessee-share tenants (4%).[13] Comparing these figures to the reported 76.3 tenancy rate for Nueva Ecija in 1960, one notes that changes have taken place perhaps not in ownership but at least in tenure status from share tenant to lessee.

On the relationship between farm size and tenure classes, Montenegro's data indicate that differentials with respect to farm size exist not only among tenure groups but also among tenants themselves (Table 6.9). One will note that the median values for farm size are smaller than the mean values because of the relatively wide dispersion which occurs in the area being cultivated by the different tenure groups. Montenegro's analysis reveals that among all farms in Bay, Laguna "the 10 percent with the larger farms operate 35 percent of the land while the 50 percent who farm the smaller farms

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[11] J. Stewart, *op. cit.*

[12] R. T. Herrera, *op. cit.*

[13] R. P. de los Reyes, IPC/BAECON Study of Socio-Economic Conditions Among Rice Farmers in Nueva Ecija, Final Report, Institute of Philippine Culture, Ateneo de Manila, 1971.

operate only 20 percent of the farm land. In Mayantoc, Tarlac, 10 percent of the larger farms operate 38 percent of the land while 50 percent who farm the smaller farms operate only 22 percent of the land." Judging from the data in Table 6.9, we would expect that the full owners, part-owners, and managers who make up the smaller groups would be the most likely operators of the larger farms referred to. However, even among tenants themselves, there are those who are large and those who are small. As Montenegro concludes from his data: "Among sharecropping tenants (Bay, Laguna), the 10 percent with larger farms operate 35 percent of the land while 50 percent of the smaller farms operate only 25 percent of the land. In Mayantoc, Tarlac, 10 percent of the larger share tenants operate 25 percent of the land while 50 percent of smaller farms operate only 26 percent of the land."[14]

Table 6.9 Tenure classes by size of farm (Mayantoc, Tarlac and Bay, Laguna), 1965.

MAYANTOC TARLAC	*Mean (In hectares)*	*Median*		*Mean (In hectares)*	*Median*
All farms	3.39	2.49	All tenants	3.39	2.48
Full owner	4.10	2.52		2.20	1.29
Part owner	2.52	2.39	Sharecrop tenants	2.20	1.29
	3.60			2.30	2.27
Tenants	2.20	1.29			
Others	7.82	4.66			
BAY, LAGUNA					
All farms	2.14	1.43		2.14	1.43
Full owner	2.20	1.40	All tenants	1.69	1.64
Part owner	3.30	2.58	Sharecrop tenants	1.65	1.36
Tenants	1.69	1.64			
Others	4.70	3.69			

Source: J.E. Montenegro, Tenure Classes (Owners, Part Owners, Tenants, Manager, etc.) by Size of Farm, 1965. IRRI Seminar, Dec. 1, 1966.

In summary, one would say that there are both large and small landholdings but a situation exists whereby large landholdings are cultivated in small farms which are operated by share tenants and leaseholders. Among farmer-cultivators there are owner-operators, and part-owners who themselves operate farms smaller than landlord holdings. Among share tenants and lessees there are those who cultivate smaller or larger farms relative to other tenants. Hence, farm size is not as simple and straightforward a variable as it appears,

[14] J. E. Montenegro, *op. cit.*

especially if it is conceived as an intervening variable which determines who will be affected positively or negatively by the new rice technology. Is it size of farm or size of landholdings which is the more crucial factor? If one adds to this the variety of existing sharing arrangements and lease rentals, then the complications are compounded even more. Farm size also means different parts of the country. Twenty hectares of rice land in Laguna is not the same as 20 hectares in Mindanao. The physical and ecological setting and the infrastructure of facilities and services will account only for part of the differences. There are other economic and socio-cultural aspects of land ownership and farming which undoubtedly differ among regions.

B. Some General Characteristics of Landlords and Their Tenants

In order to appreciate and assess the interaction, if any, between land reform and the new rice technology, it is necessary to get acquainted with the principal characters in land reform – the landlord and the tenant. Data from the Bernal, R. P. de los Reyes, and Lopez studies[15] were consolidated for this purpose. While there are many source materials about tenants, these studies have been chosen because they are the only ones which specifically provide information about landlords and their relationship to tenants.

Tables 6.10 to 6.14 show the following characteristics of landlords:

a. Absentee landlords tend to have bigger landholdings than those who reside in the area where their land is located. The average size for the former is 287 and for the latter, 37 hectares. In terms of distribution, about half of the absentee landlords have more than 100 hectares; only 3 of the resident landlords belong to that category. These landholdings tend to be fragmented with an average of 3 to 4 parcels located in different places (Table 6.10). Such a situation tends to obscure the concentration of landownership.

b. Landlords, despite the stereotype we have of them, are not all well-to-do by any means (Table 6.11). Using size of landholdings, other sources of income and certain level of living indicators, Bernal classified 112 landlords according to socio-economic position. Twenty-one percent of them belong to the upper class; they possess the trappings of good living, such as 2 or more cars; 2 or more houses, trips abroad, etc.; have other major sources of income and at

[15] E. A. Bernal, *op. cit.*, R. P. de los Reyes, *op. cit.* and M. Lopez, *op. cit.*

the same time have the biggest landholdings. The upper middle class, which is about one-third of the group, is composed of executives or government officials who live a comfortable life and own 51 to 100 hectares of land. The lower middle class, which is another one-third, are white-collar job holders like school teachers, supervisors or owners of small-retail business with few employees. Their houses are not as expensive as those of the other two upper classes and they take pride in several household appliances. A little more than 10 percent of the landlords own between 5 to 10 hectares; they operate sari-sari stores (small retail stores) and high level of living indicators are absent in their homes.

The most important observation from the data in Table 6.11 is that the bigger landowners tend to have other substantial sources of income. Those of the lower class who have small landholdings also tend to have only small businesses as other source of income and none of the prestigious symbols of "good" living. They would, therefore, be expected to depend more on income from their land for their livelihood.

Table 6.10. Total landholdings of 112 rice landlords.

Farm size in hectares	*Resident landlord*	*Resident-Absentee landlord*	*Absentee landlord*
		– N u m b e r –	
5 – 9	3	–	2
10 – 24	22	4	2
25 – 49	18	7	7
50 – 74	2	5	3
75 – 99	3	4	3
100 – 124	1	4	2
125 – 149	1	2	2
150 – 174	–	–	–
175 – 199	–	–	1
200 – 299	1	5	1
300 – 399	–	–	2
400 and above	–	–	5
Ave. Area Per Landlord	37.40	95.95	287.86*

*Includes two with 1,055 and 3,742 hectares.
Data from E. A. Bernal, *op. cit.*

c. Besides having the bigger landholdings, the absentee landlords also have more tenants. They are also the landlords who have other substantial sources of income (Table 6.11).

Table 6.11. Socio-economic position of 112 rice landlords.

Socio-economic position	*Size of farm and other sources of income*	*Level of living indicators*
1. Upper class 21%	More than 100 hectares; owners of major business or major stockholders of corporations	2 or more cars 2 or more houses Vacation and trips abroad Membership in international and national organizations
2. Upper middle class 34%	51 – 100 hectares; executives or officials of large business or in government; owners of large retail business	1 – 2 cars/jeeps; ₱25.000 - ₱50,000 value of residence Vacation and trips to Baguio and other out-of-town places in the Philippines Membership in national and local organizations
3. Lower middle 34%	11 – 50 hectares; white-collar job holders; grade school teachers; first level supervisors; owner of retail business with employees	₱10,000-₱20,000 house Local organization membership Several household appliances
4. Lower class 11%	5 – 10 hectares; engaged in small business without employees (sari-sari stores)	Absence of high level of living indicators

Source of data: E. Bernal, *op. cit.*

d. Lands have been acquired by inheritance or by purchase or both. Tenants also tended to be inherited either from the landlords, parents or from the previous landowners and have worked with them for a long time. Only about one-fourth of the tenants applied to or were asked by the landlord (Table 6.12).

e. Most of the landlords reported conjugal and individual ownership of the land (Tables 6.12 and 6.13). The latter could simply mean that the title or any possession papers are in one person's name but the proceeds from the land probably go to the family. Communal properties which refer to those lands still owned in

common by brothers and sisters were reported less in the IPC than in the Bernal study. This was evident also in the case of individually owned properties. One can speculate that this division of properties has occurred as a result of land reform (Tables 6.12 and 6.13). Although 60 percent of 112 landlords in Bernal's study said they would not buy land anymore, 26 percent were still interested in further land acquisition. In general, they also believed that increased investment

Table 6.12. Some general characteristics of 112 landlords (Bulacan and Nueva Ecija, 1965).

1.	Type of ownership		6.	Age	
	Individual	34%		Below 40	19%
	Conjugal	36%		40 – 49	29%
	Communal	19%		50 – 59	31%
	A combination of the above	11%		60 – 69	13%
				70 and above	8%
2.	How acquired		7.	Sale of rice land	
	Inherited	24%		Only 23% ever sold land	
	Bought	34%			
	Both	40%			
	Bought and leased	2%			
3.	Ave. No. of tenants		8.	Future purchase of rice land	
	Resident landlord	7		Will not buy	60%
	Resident-absentee landlord	13		Will buy	26%
	Absentee	38		Undecided	14%
4.	How tenants were acquired		9.	Attitudes toward investment	
	Inherited from parents	43%		a. Increased investment will increase farm output (Yes)	80%
	Retained upon land purchase	14%		(No)	20%
	Applied to landlord	20%		Of those who said yes, 80% are willing to invest in farm improvement.	
	Asked by landlord	6%		b. Investment preference	
	Some inherited, some applied	6%		Farm	33%
	Some inherited, some transferred	11%		Non-farm	48%
5.	Education			Non-committal	19%
	Elementary	23%	10.	Plan to sell land among those who have not sold any (Yes)	36%
	High school	22%			
	College	52%			
	Vocational	3%			

Source: E. A. Bernal, *op. cit.*

would increase farm output and were willing to invest in farm improvement. However, when asked to choose between farm and non-farm investment, only 33 percent chose the first and 48 percent, reform program. That those who own land tend to hang on to it is evidenced by only 23 percent of Bernal's sample ever having sold a parcel of their land. The rest have never sold any portion of their holdings, although the Bernal sample reported 36 percent who planned to sell mainly because of land reform.

f. The manner by which purchase of land was financed is relevant in understanding the landlord's resistance or willingness to part with his property in a land reform program. The IPC study found that 80 percent of those who bought lands used their savings or earnings and 20 percent used bank loans in addition to the savings. Pensions, backpay, and sale of other properties were the other sources. Sixty-four percent of all the land parcels were acquired after World War II and about 25 percent of postwar acquisitions were made after the land reform promulgation in 1964 (Table 6.13). In attempting to predict response to the land reform program, one would expect those who bought their properties from their savings and earnings to be less willing to give up ownership. The fact that land acquisitions were still made after land reform proclamation makes one wonder if the purchasers believed the law would actually be implemented. Otherwise, they would not have invested their money in these pieces of land.

Table 6.13. Characteristics of 73 Nueva Ecija rice landlords.

	Share	*Lessee Landlords*	*Lessee Share*
1. Area of rice land owned (median in hectares)	9.5	38.7	38.1
2. Median No. of parcels or locations of rice lands	3	3	4
3. Manner of acquisition	21% inherited 41% bought 64% of all the land parcels were acquired after World War II and about 25% of post-war acquisitions were made in 1964 after land-reform promulgation.	39% inherited 28% bought	19% inherited 48% bought
4. No. of tenants (median per landlord)	4.1	14.2	13.7

Table 6.13 (Continuation)

	Share	*Lessee Landlords*	*Lessee Share*
5. Types of ownership	50%	of all landlords report conjugal property	
	23%	individual ownership	
	8%	communal property	
	19%	a combination of the above	
6. How purchase of land was financed	80%	of those who bought lands used their savings or earnings. 20% bought lands with a bank loan added to savings. Pension, backpay and sale of other properties were other sources.	
7. Sale of land		Only 18% reported having sold a parcel of land. The rest have not sold any portion of their holdings.	
8. Age	About 57 years average		
Education	Junior High School	Senior College	Junior College
		—Percent—	
9. Travel			
Baguio	64	83	86
Hongkong	0	28	26
Tokyo	0	28	26
Europe	0	17	21
U.S. or Canada	0	22	21
10. No. of residences			
More than one	15	50	67
At least 1 passenger vehicle	29	71	76
11. Mass media exposure			
Read daily newspaper	29	72	62
Watch TV daily	21	61	38
Read magazine once a week	45	78	80
12. Involvement in politics as a candidate	15	35	14
13. Tenant-landlord division of harvest 50:50	67		55

Source: R. de los Reyes, *op. cit.*

g. Of direct relevance to land reform program are the comparative characteristics of landlords who went into leasehold arrangements with their tenants, those who shifted to some compromise leasehold or a combination of share and lease, and those

who maintained share tenancy. Tables 6.13 and 6.14 show differences in the characteristics of these three groups of landlords. The first and second groups tended to have bigger landholdings, more tenants, higher education, more travel both locally and internationally, greater exposure to mass media, and more ownership of houses and vehicles and more involvement in politics than those who maintained share tenancy. It is particularly interesting to note that a higher proportion of lease (39%) than share (21%) and lease-share (19%) landlords inherited rather than bought their landholdings. All of these findings contradict the stereotype of the big feudal landlord who would resist land reform. It is the smaller landowners who have few tenants, lower educational attainment, less exposure to mass media, lower proportion who own vehicles or more than one house, less politically involved and have a higher proportion who bought rather than inherited their lands. These are the landlords who have so far resisted land reform at least as far as the first phase of shift from share to leasehold is concerned. These findings should not at all be surprising because it is precisely the big landowners who also have occupational and wealth alternatives other than land. The small landowners more of whom bought rather than inherited their land would be more disinclined to part with what they have acquired from earnings and savings. They are in many ways the *nouveau riche* who have yet to establish themselves firmly and land is one secure basis for entrenchment. Those who have other alternatives and have more entrepreneurial acumen among the big landowners would venture into "greener pasture" in non-farm investments. However, it is also possible that the bigger landowners who are also more politically sophisticated and politically powerful do not really see the reality of land reform implementation beyond the leasehold, hence their relative lack of hesitation to go along with the first phase. After all, they might never have to part with their land anyway.

Table 6.14 provides information on characteristics of landlords and tenants belonging to the three tenure groups: share tenants, genuine leasehold and compromise leasehold. There is not much difference among the three tenant groups with respect to age, education, number of children, years of tenancy and farm size being operated. It is the three types of landlords under the three tenure arrangements who differ in characteristics, particularly in size of holdings with averages of 11.8, 206.7 and 20 hectares, respectively, for share, genuine and compromise leasehold landlords. The averages for the number of tenants are about 6, 100 and 12. De los Reyes also

found that they differ with respect to sharing arrangements with 67 percent of the share landlords and 55 percent of the lessee-share landlords; about 70 percent have written contracts with leaseholders. Needless to say, the landlords as a category are older and have much higher educational attainment (college) than their tenants (third or fourth grade). Obviously the only thing they have in common is the relationship arising from the land which the landlord owns and the tenant cultivates.

Table 6.14. Characteristics of tenants and landlords by tenure groups.

Average characteristics	*Share tenancy*		*Genuine leasehold*		*Compromise leasehold*	
	Tenant	*Landlord*	*Tenant*	*Landlord*	*Tenant*	*Landlord*
1. Age	51.0	58.5	49.0	60.6	48.0	60.0
2. Education (years of schooling)	3.3	8.5	4.0	10.5	3.2	9.3
3. Wife's age	46.8	–	46.0	–	43.6	–
4. Wife's education	3.1	7.0	3.7	12.6	2.5	5.9
5. Children's average age	18.0	23.9	15.8	26.5	13.8	21.4
6. No. of children	6.3	4.7	6.3	6.6	6.4	3.8
7. Farm size (Size of holdings for landlord)	3.1	11.8	3.2	206.7	2.8	20.1
8. Total No. of years as tenant	24.7	–	22.8	–	20.5	–
9. No. of years as tenants of landlord studied	18.5	–	20.6	–	18.0	–
10. No. of tenants	–	5.9	–	99.5	–	12.0

Data were obtained from R. Lopez, *op. cit.*, Tables 10, 37 and 40, pp. 221 and 230.

Her study which was done in Nueva Ecija estimated a total of 70,800 rice farmers broken down as follows: 8,200 owner-cultivators (11%); 4,800 part-owners (7%); 28,900 lessees (41%); 2,800 lessee-share tenants (4%); and 26,100 share tenants (37%). From a sample of 1,028 farmers, certain background characteristics were identified. Thirty-eight percent of them have finished elementary

schooling but there are tenurial differences with owner-operators and part-owners reporting a median of six grades; share tenants, five grades and lessees, four grades. With housing facilities as an indicator, owner-operators have more durable and bigger houses located in larger-sized home lots. For example, only 10 percent of tenants as against 40 percent of owner-operators live in homes made of concrete materials. The latter also have a median-sized house of 32 square meters while tenants have only about 24. The median area of the house lot is 600 sq. m. for the owner-operators and 350 for share tenants. The size of both house and lot declined progressively from owner-operator, part-owner, lessee to share tenant. In terms of health and sanitation, 90 percent of rice farmers studied have a private force pump in their homes but about two-thirds have open pit toilets and 10 percent have no toilets at all. Rice farmers also tended to come from rice farming families and have very low mobility in terms of residence. Owner-operators tended to continue farming parcels of land which grandfathers and parents worked on, while tenants moved from one parcel to another due to difficulties in relations with landlords, soil productivity, etc. As pointed out earlier, tenants have been tenants for a long time (about 20 years) and most were inherited with the land or went with the transfer of property from one owner to another. Indebtedness to others was reported by 70 percent of all the rice farmers but the size of the debts declined from owner-operator, part-owner, lessee to share tenant. Perhaps this is related to available collateral, hence credit-worthiness especially for production loans. More of the owner-operators get credit from banks while half of the lessees obtain credit from moneylenders and the same proportion of share tenants are provided loans by their landlords.

C. Landlord-Tenant Response to the Land Reform Program

With the enactment of the Agricultural Land Reform Code in 1963 and the implementation of a land reform program, how did the landlords and the tenants respond to this Act which was hailed as "the key to the emancipation of the Filipino farmers from the centuries-old bondage of share tenancy which usually leaves tenants little initiative, a low level of living, and prevents improvement in their productivity"? [16] As the former Governor of the Land

[16]Narciso M. Mindajao, The Adoption of Agricultural Leasehold in Selected Land Reform Project Team Areas in Bulacan Province. Unpublished M. S. Thesis, U. P. College of Agriculture, 1971.

Authority puts it —" . . . the only condition our farmers have known is poverty. He has inherited a social malady. He is anchored to the land he does not own. He is forced to produce a maximum harvest and yet is caught in a system where additional effort is not compensated. A high degree of dependency has been bred between the farmer as tenant and his landlord as owner. The only relationship they have is sharecropping. This produces an abusive accumulation of wealth by the few and an inequitable distribution of products."[17]

Because the leasehold system is the first phase of the land reform program, its acceptance or rejection by tenants and landlords was regarded as vital to implementation. Among its salient features are: (a) automatic conversion of share tenancy to leasehold when an area is declared a land reform area; (b) the lessee pays the landowner a fixed rental of 25 percent of the average normal harvest during the three agricultural years immediately preceding the establishment of leasehold after deducting the expenses for seeds, the cost of harvesting, threshing, loading, hauling and processing, whichever are applicable; (c) from leaseholder the farmer may become an amortizing owner, then full owner of the farm lot; (d) credit facilities and technical assistance are to be provided to the leaseholder by the government through its appropriate agencies; and (e) the landowner has the right to appeal to court to eject his tenants because he wants to cultivate the land personally.

There are two avenues for shifting to leasehold as provided for in the Agricultural Land Reform Code: (a) By voluntary election whereby a share tenant notifies his landlord in writing at least one month before the next agricultural year that he is going into leasehold. If the landowner agrees, they sign the contract. If not, the farmer can bring the petition to the Court of Agrarian Relations which decides the matter. (b) By proclamation of an area as a land reform area. The shift from share tenancy to leasehold is automatic and it means that all agencies relating to agricultural leasehold have been put into operation to assist farmers in everything they need.

With all the measures designed to liberate the share tenants from a "life of poverty, bondage and injustice," one would think that tenants would have been enthusiastic to shift to leasehold in order to take advantage of the Code's provisions. For a glimpse into the predispositions, attitudes and actual behavioral responses to the

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[17]Conrado F. Estrella, "New Guidelines for Land Reform," *Solidarity*, Vol. 6, No. 7, July 1971, pp. 2-12.

program, the results of several relevant studies are reviewed. Douglas who conducted a study of 50 farmers in Gapan, Nueva Ecija (Tables 6.15 and 6.16) two years after the Code was passed found them to be optimistic about the future; the present was perceived as better than the past; future living conditions were expected to be better and were even optimistic about prospects for more people to own land in the future. They also favored change in the existing land tenure.

Although the future looked bright the present way of life in Gapan was considered very inadequate. Compared to the farmers, fewer town leaders thought future living conditions would be better. There were also fewer of them who favored change in the land tenure system. This latter response in understandable, since town leaders were probably landowners. In general, the farmers were also more positive than the town leaders regarding what the government was doing to help solve the country's problems. Both groups, however, agreed that the government should be more active in bringing about community improvement. From the responses in Table 6.15, farmers also seemed to prefer science-based knowledge to luck, omens and old ancestors' work techniques. Table 6.15 shows that despite the expressed desire to see changes in the land tenure system, the farmers preferred an adjustment (66%) within the existing system (such as better crop-sharing ratios) rather than a complete overhaul of the system (16%). There were also 18 percent who favored a retention of the old system because of harmonious relation with the landlord. Although the Douglas study covered only 50 farmers and 23 town leaders, the findings somehow anticipated the results of other studies.

Table 6.15. Attitudes of farmers and community leaders toward change, toward government projects, and toward science-based innovation (50 farmers from 2 barrios and 23 town leaders, Gapan, Nueva Ecija).*

Topic	*Poles*	*Farmers*		*Leaders*	
		Positive	*Negative*	*Positive*	*Negative*
		*– Percent** –*			
A. Optimism about direction of change					
1. Future (10-15 years ahead)	Improvement/ decline	72.5	9.8	78.1	13.0
2. Past (time of youth age 10-12)	Better now/ Worse now	58.5	31.3	73.8	25.9
3. Future landowner-ship prospects	More will own/ Fewer will own	54.8	13.7	52.0	8.6

Table 6.15 (Continuation)

Topic	*Poles*	*Farmers*		*Leaders*	
		Positive	*Negative*	*Positive*	*Negative*
		—*Percent*—			
4. Future living conditions	Future better/ Future worse	58.8	29.3	39.0	47.7
5. Present Gapan way of life	Adequate/ Inadequate	13.7	66.6	17.3	69.5
6. Favor change in present land tenure system	Pro-change/ Anti-change	64.6	15.6	21.6	39.0
B. Belief in community improvement through government activity					
1. Helpfulness of barrio gov't.	Helpful/ Harmful	66.2	13.6	—	—
2. Barrio should undertake more projects	More/fewer or none	94.0	6.0	—	—
3. Helpfulness of municipal gov't.	Helpful/ Not helpful	80.2	19.8	78.2	—
4. Helpfulness of national gov't.	Helpful	80.2	19.8	69.4	4.3
5. Government doing all or some necessary things to solve country's problems	Yes/none or only a few	76.3	23.7	26.0	26.0
6. Gov't in general should be more active	More/same or less	92.2	7.8	100.0	
C. Preference for science-based knowledge and innovation					
1. Value of work techniques of father's generation	Obsolete/ Useful	13.6	86.1	25.9	73.8
2. Accuracy of omens in foretelling	Inaccurate/ Accurate	23.7	11.6	45.4	4.5
3. Ability or luck and connections determine success	Ability/Luck and connections	43.0	43.0	47.7	34.7
4. Value of professor's advice and science for crop culture	Valuable/ Not valuable	74.4	3.8	91.2	8.6

*Data from: Louis H. Douglas, *Fifty Farmers of Gapan: The Propensity to Develop in One Rural Philippine Situation,* Kansas State Univ., Spring 1966 (mimeo, 46 pp.).

**The neutral responses are not included in the tabulations, hence the two percentages do not total 100.

Table 6.16. Attitudes expressed as reasons for position on land reform*

1. Retain old system of land tenure *in toto*	18%
a. Harmonious relations with landlord	
b. No difference	
2. Completely overhaul the system	16%
3. Adjust within the system	66%
a. Better crop sharing ration (75-25)	
b. Better sharing of expenses	
c. Curb usury	
d. Make any changes that are good	

*Data from Louis H. Douglas, *op. cit.*

The 1964-65 Annual Report of the Land Reform Project Team in Plaridel, Bulacan (the first place to be declared land reform area) cited the persistent refusal of farmers to shift to leasehold from share tenancy. Of the 1379 farmers studied in the first land reform area to be proclaimed, 724, or 53 percent, refused to enter into leasehold and 362, or 26 percent, refused altogether the technical services of field personnel. A 1967 report[18] from the same municipality says that out of 439 share tenants who refused to shift to leasehold, 87 percent claimed to be satisfied with their present status. Reasons for refusal were: they could easily borrow money from the landlord for any purpose; kin relations with the landlord; and plain good relationships. The rest of the respondents were dissatisfied with share tenancy but could not shift to leasehold due to fear of ejection or harassment by the landlord; fear that the landlord would no longer extend credit; unwillingness to speak to the landlord about the matter; and wait-and-see attitude resulting from a lack of confidence in the success of the land reform program. Lessees who did not want to enter into written contracts with the landlord said: "The landlord is known to be a good man and as such keeps his word of honor." A written or oral contract does not make a difference to the tenant. The landlord forfeits as a favor and as a bargain to the tenant his share in the second crop.

Another survey was conducted in 1968 in old land reform areas in Bulacan, Nueva Ecija, Bataan, Pangasinan and Pampanga and

[18]Eugenio Lopez, *A Study of Certain Aspects of Leasehold and Credit Operations in Plaridel, Bulacan.* Plans and Program Office, National Land Reform Council, Diliman, Quezon City, (mimeo), May 19, 1967.

which included both lessees and share tenants. When tenants were asked what sort of attitudes landlords had toward them, majority of the answers were favorable to the landlord. Even before land reform operations in Concepcion, Tarlac, tenants had already claimed that the landlord is a "person who looks after himself but who is much interested in the tenants' well-being." There were others who admitted that "his landlord is a person who tries to give him (the tenant) as much as he can." These opinions about the landlord are more pronounced among ex-tenants who are now lessees in Plaridel, Bulacan and San Luis, Pampanga which were surveyed after one year of land reform operations. Majority of the landlords surveyed also regarded their tenants as honest and loyal.[19]

As of 1971, Mindajao reported that in Bulacan with 24 municipalities proclaimed land reform areas, only 4,540 or 24 percent of 18,564 share tenants had adopted leasehold. The rest opted to remain share tenants. The reasons for this reaction were revealed in Mindajao's study of 60 leaseholders and 60 share tenants from four land reform project team areas in Bulacan. Farmers who had been exposed or were knowledgeable about the salient features of the agricultural leasehold system were more likely to perceive its relative advantages such as being better off, having more share from the harvest and being able to provide better care for their family. Those who perceived these advantages had more tendency to indicate personal rather than mass media as sources of their information about land reform. Although farmers perceived the relative advantages of leasehold, those who feared ejection by landlords were less likely to adopt leasehold. On the other hand, those who perceived the advantages of leasehold and at the same time perceived the availability of farming inputs were more likely to shift to leasehold. Both those who had good interpersonal relations with their landlords and those whose relations were not so good perceived the relative advantages of leasehold. However, when the share tenants were asked why they had not made the shift, 48 percent gave as the main reason, the fact that they had harmonious relations with their landlords; 13 percent were apprehensive about the possibility of ejection by way of the legal provision on personal cultivation by the landlords; and 8 percent said that the landowner was a kin relation and kind to them. Among the reasons given by those who adopted

[19]Index Inc. June 1968. Report of Robot-Gallup Survey, National Land Reform Council, March-April, 1968.

leasehold: 33 percent wanted to raise their standard of living and to make their life better; 23 percent expected to get a bigger share from their farm produce; and 12 percent welcomed the chance to become managers of their own farms and be able to decide independently on farming matters.[20]

Baskiñas in her interview of 19 farmers who shifted from share tenancy to leasehold even before Laguna was declared a land reform area provides insights complementary to reasons of share tenants for refusing to shift. Unhealthy landlord-tenant relations, landlord's wish, implementation of the land reform program and desire for bigger share and higher income were cited as the rationale of lessees for changing their tenure status.[21] Just like Mindajao, Sandoval *et al.*[22] reported that of the 366 share tenants studied in 1967-68 from 7 provinces of Central Luzon, 117 or 32 percent remained share tenants. Of these 117, there were 49 or 41 percent who were not willing to shift to leasehold for reasons of good relations with the landlord. It should be pointed out that at the time of the survey in 1968, only 15 percent of more than 500 rice farmers claimed they understood "very well" the land reform program; 26 percent said "fairly well"; 34 percent reported "not very well"; 5 percent "not at all"; and 20 percent did not give any indication. When asked about their impression of the land reform program, 71 percent said, "it's good"; but considering that only a small proportion understood the program well, this concept of "goodness" of the program is a very vague one. This lack of comprehension on the part of the farmers about the land reform program must have contributed to its slow acceptance of leasehold although the Mindajao study pointed out that perceived advantages of leasehold led to shift to leasehold if farming inputs were available -- from sources other than the landlord. Further support for this need is also found in the Sandoval *et al.* survey which revealed that the forms of assistance most preferred by farmers were technical assistance, 38 percent; financial, 26 percent; and legal assistance, 3 percent. The rest did not indicate preference. Apparently from the point of view of rice farmers, land

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[20]N. M. Mindajao, *op. cit.*

[21]Juanita P. Baskiñas, Leasehold Tenancy: A Step to Rural Development, *Journal of Agricultural Economics and Development,* Vol. 1, No. 1, Jan. 1971, pp. 27-41.

[22]P. R. Sandoval, *et al., An Economic Analysis of the Effects of Land Reform in Selected Areas in the Philippines.* Seminar paper presented at the Department of Agricultural Economics, U.P. College of Agriculture, Feb. 21, 1969.

reform involves mostly technical and financial assistance and only minimally legal assistance.

As was discussed earlier from the IPC and Lopez studies, the landlords who have gone into leasehold have bigger landholdings, higher education, are more modernizing, more politically inclined and more well-off than those landlords who remained in the sharing system. Although this augers well for changing social structure, certain responses to the leasehold provision of the land reform program deserve to be examined. Contrary to the notion that share tenancy is "bad" and should be eliminated, 40 percent of the Nueva Ecija farmers (IPC study) who had been share tenants said it was "a good" system; 30 percent said it was "not good"; and the rest thought it might be good or bad depending on certain conditions. The often cited reason for the share tenants' refusal to shift to leasehold as being due to kin relations with the landlord was not found to be as important as has been previously assumed because the study showed that only about one-fourth of the tenants were kins of the landlords. Share tenancy was considered good because the landlord shared farming expenses and provided inputs; it was the only way of life for which they were prepared; and that landlords were generally good. Furthermore, they mentioned the prospects of a large share when harvests were good and that as long as the yield was good, share tenancy was a good thing. More than half of the share tenants preferred a good sharing arrangement to leasehold and they also preferred assured tenancy to ownership of the land they were farming. As a matter of fact, 45 percent of the share tenants interviewed intended to remain in that status, 23 percent were determined to get out, while 31 percent were uncertain as to what they wanted to do. As expected, 89 percent of the lessees favored the lease system with bigger share of the harvest and freedom to operate the farm more independently as important reasons. They also emphasized the pressure on themselves to be thrifty and industrious in order to have a good yield and ability to finance their farming. Adverse reaction to leasehold was due to the lessee's having to pay rental in spite of crop failure.

On the part of the landlords, more than half of the lessee-share landlords favored the conversion of share tenancy to leasehold but about half of share landlords were against it. Although majority of the landlords thought that share tenants would eventually become lessees, about 70 percent of them predicted that a reversion to share

tenancy would occur. Less than 20 percent anticipated lessee continuity. Their major reason for pessimism was the lessee's lack of sources for farm expenses. On the land reform program itself, more than 75 percent of the landlords recognized the equity objective; about 15 percent saw its productivity component which aims to motivate farmers to work hard and learn scientific farming in order to increase rice production. The rest were cynical and regarded the Code as a political gimmick to obtain more votes from the masses. Despite an understanding of its objectives, almost 60 percent of the landlords complained that the land reform program had only resulted in ill-feelings between landlord and tenants. They also resented the fact that despite the disadvantages which had accrued on their side, the landlord was still referred to as the *oppressor.* It is also revealing of changing status relations that tenants are said to have become "aggressive and proud." Undoubtedly, most of the landlords (70 percent) considered the program as beneficial to tenants and against landlords, particularly in terms of increased tenant's share of the produce. As a consequence, half of all landlords no longer considered acquiring rice land as a good investment.

For a more comprehensive analysis of landlord-tenant relations and their effects on tenant response to the land reform program, Lopez' study of 117 tenants and 59 landlord pairs from 7 provinces of Central Luzon provides valuable insights. In the study, tenant response to land reform was categorized into three types: those who remained *share tenants*; those who shifted to leasehold as per legal provision with registered written agreements, known as *genuine leasehold*; and those under *compromise leasehold* which is legally acceptable although it carries only an oral contract. When a number of factors were examined for their relationship to land reform response, several significant observations emerged. Contrary to the common stereotype that the landlord is not only master of his tenant's life, the Lopez' study showed that out of the 117 pairs of landlord-tenants in 9 spheres of activity where the landlords could have dictated to their tenants, thus making up a total of 1,053 possible "dictate situations," there were only six actual dictate cases, four of which were concerned with preventing the tenant from shifting to leasehold. Only two were followed. The other spheres of activity studied for possible dictate by landlord and acceptance by tenant were: use of pesticides, use of weedicides, straight-row planting, prevention from forming associations, prevention from relating to the Agricultural Credit Administration and the Land

Reform personnel, which in many ways would inhibit the shift to leasehold.

Comparing the three groups of tenants with respect to precipitating factors which are significantly related to acceptance of leasehold, Lopez found that the genuine leaseholders were more knowledgeable of their rights as tenants and had greater access to legal defenders (private lawyers and public defenders) than compromise lessees; the share tenants had the least access to this facility. Genuine lessees also had greater consciousness of and accessibility to alternative sources of financial loans such as the Agricultural Credit Administration, the Philippine National Bank, the Rural Bank and private moneylenders other than their landlords. Although the three groups did not differ significantly in their consciousness of skills they possessed and alternative occupation they could engage in which would be more profitable than farming, share tenants showed a lower consciousness of occupational alternatives than the two other groups. It is important to recognize, however, that about two-thirds of the respondents had little awareness of such alternatives. In other words, majority of them saw no other occupational opportunity outside of farming. Another interesting observation is the expression of benevolent paternalism in reverse, i.e., the more the tenants felt they were greatly needed by their landlords and the more they thought it would be difficult for the landlords to find replacements should they quit, the more the tenants were likely to stay on as share tenants, as if they pitied their landlords.

It has often been argued that the tenant's debt of gratitude *(utang na loob)* to his landlord prevents him from shifting to leasehold, hence Lopez' study hypothesized that the greater the service rendered by the landlord to his tenants, the greater the likelihood that they would remain share tenants. The data did not support the hypothesis. The three groups did not differ significantly as far as services from the landlord were concerned although as expected, there was a higher percentage of share tenants who had received greater services from their landlords before land reform. This situation could be interpreted as a potential restraining influence on the part of the landlord over his tenant. But is this potential influence so actualized as to be really effective? The data show one case where the landlord actually exercised his influence over the tenant so he would remain a share tenant. There were two cases of genuine leaseholders who admitted good relations with the landlord and expressed initial reluctance to shift for reasons of

gratitude, but the landlord induced them to shift because he believed that leasehold was beneficial to both parties. Another landlord who was providing loans to his tenant opposed land reform but did not interfere when the share tenant shifted except for a request that it be a compromise leasehold. The study also indicated that it was not the amount of services rendered by the landlord *per se* but rather the value attached by the tenant to the services which enabled the landlord to have influence provided he would in fact, exert the influence. These services acquired a quality of influence over the tenant, especially when he had no alternative resources.

The tenants in the seven provinces differed significantly in the importance attached to four types of services such as: financial loan, financial help, home lot and miscellaneous services. Those from Nueva Ecija gave greater importance to home lot and financial help. Bataan considered miscellaneous services of greater value, and Pampanga, financial loans. However, the home lot was uniformly given by tenants in seven provinces greater importance than any of the other services. This is understandable because their very existence depends on whether or not there is a plot of land on which they could put up a house. Before land reform, the amount of services rendered by the landlord to his tenant was not related to whether or not the landlord approved or opposed the provisions of the Land Reform Code but after five years of land reform implementation the intensity of services provided by the landlord differed significantly among the three groups, with the greatest services received by those who remained share tenants, followed by compromise lessees; genuine lessees had services from the landlord considerably reduced.

Lopez' explanation for this turn of events is that the act of shifting to leasehold was not immediately perceived as a part of the giving-and-taking process. In the beginning, it was conceived neither as a favor nor a disfavor. It was only when the social meaning of land reform became internalized as part of their exchange of relations that the act to shift or not to shift to leasehold became an ingredient in the bargaining. On the part of the landlord, he must offer services to win the tenant away from leasehold. On the part of the tenant, not to shift means a possibility of demanding more services from the landlord. It is probably at this point where the mere presence of a land reform law has been beneficial to the tenant even if only because this is an option he now has which he did not have before.

Of some significance also is the fact that tenants who shifted to genuine leasehold were residing farthest from their landlords, com-

pared to the compromise lessees and those who remained share tenants. Apparently, the geographic distance between landlord and tenant prevented the closeness of social ties, thus making it easier for the genuine lessees to break away. Similar observations were made by Herrera in a recent study conducted in the rainfed, rice village of Mahipon in Gapan, Nueva Ecija. An inquiry as to why there were more lessees in Mahipon than in the irrigated and more developed villages revealed that absentee landlords who also had more tenants were more predisposed to contractual relations characteristic of leasehold arrangements. Furthermore, the presence of several tenants tilling land for one landlord enabled the tenants to approach the landlord as a group in order to ask for leasehold. There was less embarrassment as a group than as individual tenants making such a request to a landlord, especially if the latter happened to be residing nearby.[23]

As a rough general indicator of landlord-tenant response to the leasehold aspect of the land reform program, the conversion rate from share tenancy to leasehold may be used. As of June 1967, 10,022 share tenants out of 407,699 had shifted to leasehold.. This represents 2.4 percent conversion out of the total.[24] In 62 municipalities proclaimed land reform by 1968, there were 13, 377 out of 86,939 share tenant farmers in the proclaimed area who obtained leasehold contracts. Although this would be about 15 percent for the proclaimed areas in terms of the total picture, it is only 3.2 percent. As of December 1969, in the 54 proclaimed municipalities, 28,616 out of 196,365 or 15 percent share tenants had been converted to leasehold agreements of one kind or another. Only 6,663 (3.4 percent) were written and duly registered. About 2 percent were written but not registered and the remainder were oral many of which probably will not meet the criteria specified in the Code. Again, as a proportion of the total number of share tenants, 28,616 means only about 7 percent. It was also found that municipalities proclaimed in 1964, 1965 and 1966 have higher rates of conversion with 60 percent reported including oral agreements; 18 percent were reported for 1968 proclaimed areas and much lower for 1969 proclamations. The latter were not accompanied by increase in resources and legal services made available.[25]

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[23]R. T. Herrera, *op. cit.*

[24]National Land Reform Council, Land Reform Leasehold Operations: A Four-Year Program 1968-1972. Diliman, Quezon City.

[25]USAID, Land Reform in the Philippines, *op. cit.*

A review of land reform conducted by a four-man study team in 1969 concluded that "the land reform program has had only limited success with less than 4 percent of the share tenants in proclaimed land reform areas converted to registered leasehold status, 2 percent having unregistered written leases and 9 percent said to have arrived at oral agreement." The report tags the inefficient administrative structure as one of the primary causes citing such salient defects as: lack of coordination among the various land reform agencies which retain their independence and control over their respective resources; inadequate financial, logistical and technical support to field personnel; shortage of effective legal officers to assist in conversion; and absence of an efficient mechanism for finalization of titles. Considered as secondary problems are inadequate farm credit and marketing arrangements and the lack of effective institutions through which the land reform program should be administered.[26] A 1971 report noted that while Nueva Ecija which is a pilot project in land reform showed 44 percent, the national program reported only 3 percent conversion from share tenancy to leasehold.[27]

D. Landlord-Tenant Roles (Actual, Perceived and Expected)

In the web of landlord-tenant relations directly or indirectly associated with the requirements of rice farming, the two parties to the tenure system assume certain roles. A land reform program by its very essence is designated to change those roles. Bernal's typology of landlords[28] gives us an idea as to their outlook on farm development and personal relations between them and their tenants. Again, this typology helps avoid the single stereotype of the landlord and instead provides the following "ideal types" within which landlords vary in real life:

(1) *Traditional-paternalistic.* — Those who regard the personal relations of give and take between landlord and tenant as more important than the monetary expressions of costs and returns. The old arrangement is permitted to go on. The landlord projects a father image with a distinct superordinate-subordinate type of relation-

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[26]Rolando Espina, Pessimism Clouds Future of Land Reform Program, *Manila Chronicle,* March 18, 1970, p. 1.

[27]U. S. AID, USAID Development Assistance to the Republic of the Philippines, Fiscal Year 1971.

[28]E. A. Bernal, *op. cit.*

ship. Any formalization of arrangements is frowned upon, lest it stand in the way of their relations.

(2) *Traditional-nonpaternalistic.* – They are not concerned with either farm development or personal landlord-tenant relations. Old arrangements with respect to farm management are permitted to go on but they have eased themselves from personal ties with the tenants.They have interests other than the farm and they may be aptly labeled as the *indifferent landlords.*

(3) *Modern-paternalistic.* – Landlords who take advantage of the paternalistic practices for an ulterior motive – that of driving the tenants toward greater efficiency. They are apt to keep up with modern trends in agriculture and are willing directors of the development of their own farms.

(4) *Modern-nonpaternalistic.* – Landlords who have grown up away from the farm and have been in contact with the industrializing sector. They tend to look at farming as another business that ought to be profitable and would deal with their tenants in the same manner as their business associates.

Of the 112 rice landlords studied, 84 percent were classified as modern-paternalistic; 10 percent, modern-nonpaternalistic; 5 percent, traditional-paternalistic; and 1 percent, traditional-nonpaternalistic. The prevalence of the category called modern-paternalistic reflects an opportunistic combination of what is desirable from the old and the new ways of dealing with the management of rice farms. To utilize paternalism in the interest of increasing productivity represents a very calculated approach on the part of the landlords.

With respect to participation in the farm business, Torres and Sandoval identified two types of landlords: (1) *Managing landlords,* those who take a direct hand in supervising and coordinating the productive activities on the farm. As the capitalist, the managing landlord is also in varying degrees the ultimate decision-maker on the farm. (2) *Non-managing landlords* are mostly absentees who delegate the management of the farm to an overseer or the tenants themselves. These include big city businessmen, career people and retirees who do not manage the farms they own. Between these two types are varying categories:

(a) *Managing landlords* who operate a portion but lease other landholdings.

(b) *Part-time farmers* who have another major source of income and who visit the farm only on weekends.

(c) *Gentlemen farmers* whose only source of income is the farm and are therefore available to supervise farm activities.

(d) *Peasant landlords* who own a piece of land but are culturally and economically undifferentiated from the rest of the barrio people.

Among the duties these rice landlords allocate to themselves with respect to their tenants are: credit assistance, followed by provision of rations, and housing facilities. Ten percent said they had no obligations to the tenants (Table 6.17). Of tenant obligations to the landlord, "to work well on the land" was mentioned by 65 percent of the landlords. More than a third also expected to be given a share in secondary crops. Twenty percent of them still expected tenants to perform free services at the landlord's home. That this expectation existed even in 1965 when Bernal's study was conducted is some evidence of a lingering "feudalistic" vestige.

Table 6.17. Duties/obligations of landlord to tenants and tenants to landlord as viewed by 112 rice landlords.

Landlord duties	*Percent of total*	*Tenants' duties*	*Percent of total*
1. Credit assistance	90	1. Work well on the land	65
2. Provision of ration	71	2. Give landlord a share in secondary crop	35
3. Housing facilities	46	3. Perform free services at home	20
4. None	10		

Source of data: E. A. Bernal, *op. cit.*

Table 6.18 shows Lopez' data on tenants' perceptions of their landlord's roles before and after land reform. Some of the roles defined for the landlord exhibit a high degree of agreement among the tenants. Among the more definitive roles in the economic sphere are for the landlord to (a) provide the tenant extra emergency funds aside from operational farm expenses which are nondeductible from the harvest, (b) praise his tenants for a good harvest, (c) give free rice and other food supplies to augment family supplies, (d) let tenants decide how to cultivate the land and what variety to plant, and (e) be strict with tenants who are not his friends or relatives.

Table 6.18. Tenants' perception of their landlord's role before and after land reform. (Data were obtained from Rogelio Lopez, *op. cit.*, Tables 30 and 32 pp. 199-209)

Expectations	*Before*		*After*	
	Positive	*Negative*	*Positive*	*Negative*
		—*Percent*—		
A. *Economic sphere*				
1. The landlord should provide the tenant with extra funds aside from operational expenses, in cases of emergency, which are not deductible from the harvest nor to be repaid by the tenant.	83	17	75	25
2. The landlord should think a good harvest on the farm is a result of the tenant's fear that a bad one might result in his being ejected by the landlord.	9	92	6	94
3. The landlord is strict with tenants who are not his relatives or friends.	74	26	77	23
4. In case of a good harvest, the landlord should praise his tenants; in case of failure, he should console them for they will be, after all, more affected by it.	81	19	78	22
5. The landlord should give free to tenants some palay and other food supply in order to augment their supplies for their families.	78	22	72	28
6. The landlord should inform his tenants about better farming techniques and rice variety to plant in the field.	44	56	37	63
7. The landlord should just let the tenants decide how to cultivate the land and what variety to plant in the field.	86	14	86	14

Table 6.18 (Continuation)

Expectations	Before		After	
	Positive	Negative	Positive	Negative
8. The landlord should inspect the field personally every now and then to find out how his tenants are getting along.	36	64	31	69
9. The landlord should not think field inspection is a necessary part of his job as a landlord, whether he has an overseer or not.	68	32	64	36
B. *On the tenancy arrangement*				
10. The landlord should bear in mind that a written agreement with his tenants will make their mutual personal relationship artificial.	39	61	39	61
11. The landlord should eject a tenant who insists on a written contract because a written contract is a breach of their mutual personal understanding.	24	76	24	76
12. The landlord should have a written contract with some but not all of his tenants.	48	52	46	54
13. The landlord should remind his tenants that an oral agreement between themselves is just as good as a written one.	88	12	88	12
14. It is the landlord's duty to help the tenants in case the latter find difficulties in fulfilling the terms agreed on orally or in a written contract.	94	6	92	8
15. Being the owner of the land, the landlord has the				

Table 6.18 (Continuation)

Expectations	*Before*		*After*	
	Positive	*Negative*	*Positive*	*Negative*
right to determine his own terms to be included in the agreement before the tenant does.	46	54	44	56
16. The landlord may also think that the tenant should be the first to insist on the terms to be agreed upon.	68	32	71	29
17. The landlord should see to it that the terms agreed upon with his tenants are faithfully observed.	94	6	92	8
18. The landlord should let the traditional agreement between him and his tenants be the one enforced forever.	90	10	85	15
C. *In the sphere of politics*				
19. The landlord should expect that his tenants will support the landlord's candidate during election time and that his tenants should not wait to be told to do so.	28	72	20	80
20. The landlord should think that his tenants are obliged to vote for his candidates.	15	85	6	94
21. Should the candidate give money to the landlord for his tenants, the landlord should give only to those who are his favorites.	14	86	8	92
22. The landlord should try to win over his tenants with fond jokes and festive treats in order to get their support during election.	23	77	19	81
23. For the sake of his tenants, the landlord				

Table 6.18 (Continuation)

Expectations	Before		After	
	Positive	Negative	Positive	Negative
should ask for any kind of help from the candidates.	14	86	6	94
24. The landlord should force his tenants to vote for his candidates.	11	89	7	93
25. Let the tenants choose for themselves their candidates.	90	10	88	12
26. The landlord should make a house-to-house campaign among his tenants in order to request them to vote for his candidates.	15	85	9	91
27. The landlord should leave the task of getting the tenants' support to the candidates or his leaders.	73	27	90	10
D. *In the sphere of religion*				
28. The landlord should see to it that his tenants profess the same religion as he does.	9	91	7	93
29. The landlord should reprimand or punish those tenants who do not go to church.	5	95	4	96
30. The landlord should prefer tenants who are known to be religious.	85	15	88	12
31. The landlord should explain to his tenants the teaching of the church so that they will know how to lead Christian lives.	15	85	13	87
32. The landlord should take care of the tenants' church expenses for such				

Table 6.18 (Continuation)

Expectations	*Before*		*After*	
	Positive	*Negative*	*Positive*	*Negative*
events as baptisms, wedding and others.	10	90	10	90
33. The landlord should ask his tenants to keep sacred articles in their homes like the crucifix or sacred pictures.	3	97	3	97
34. The landlord should leave the priest alone to deal with the tenants concerning their religious affiliations.	86	14	86	14
35. The landlord should warn his tenants not to entertain ministers of Protestant sects.	10	90	9	91
36. The landlord does not interfere with the religious affiliations of his tenants.	84	16	85	15
E. *In the social or recreational sphere*				
37. The landlord should consider his tenants' families as extensions of his own family circle.	88	12	86	14
38. The landlord orders his tenants to follow everything that he or his children tell them to do.	10	90	9	91
39. The landlord allows some tenants only or their children to mingle with his own children.	24	76	23	77
40. The landlord should ask his children to have get-together affairs with the tenants' children or himself and his wife should mix socially with his tenants and their wives.	41	59	59	41
41. The landlord should provide his tenants with recreational facilities.	45	55	44	56

Table 6.18 (Continuation)

Expectations	Before		After	
	Positive	Negative	Positive	Negative
42. Any social gatherings of tenants should be held only with the permission of the landlord.	9	91	10	90
43. The landlord should let the tenants worry about their own recreational needs.	94	6	95	5
44. The landlord should lead his tenants in social affairs.	9	91	20	80
45. The landlord should be always ready to join social affairs to which he is invited by the tenants.	75	25	72	28
F. *In the sphere of education*				
46. The landlord should consider himself responsible for the education of his tenants' children.	17	83	15	85
47. The landlord should not allow his tenants to send their children to school so they will have helpers on the farm.	12	88	12	88
48. The landlord should give material support, especially to the children of his favorite tenants.	32	68	35	65
49. The landlord should advise his tenants as well as their children on the necessity of formal education.	52	48	52	48
50. The landlord should give clothing allowances and other material support for the study of his tenants' children.	23	77	24	76
51. It is up to the landlord to decide whether or not his children will be sent to school.	3	97	4	96

Table 6 18 (Continuation)

Expectations	*Before*		*After*	
	Positive	*Negative*	*Positive*	*Negative*
52. Let the tenants decide for themselves what to do concerning their children's education.	94	6	83	17
53. The landlord should persuade his tenants to send their children to school.	48	52	45	55
54. The landlord need not concern himself about the education of his tenant's children.	52	48	50	50

Personal field inspection by the landlord was not regarded as necessary. Feelings about this practice became even more negative after land reform.

On tenancy arrangement, the role definitions were very inconsistent, probably suggesting the inner conflicts between traditional-personalistic relations and the current push for more contractual arrangements. For example, while they did not endorse the statement that a written agreement led to artificial mutual personal relationships, they believed that an oral agreement was just as good as a written one but that a tenant should not be ejected for insisting on a written contract. At the same time, they also believed that the traditional agreement between them and the landlord should be the one enforced forever. However, there was a general endorsement of the desirability to fulfill the terms agreed upon whether in a written or oral contract. The tenant-respondents were divided on the question as to whether the written contract should be only with some but not all of the landlord's tenants. They were also ambivalent as to whether the landlord had the same prior right to determine the terms of a contract. They rather hoped the landlord would think that the tenant had the first priority to insist on the contract terms.

In the sphere of politics, there was a very well-expressed desire for the tenants to be left alone to make their own decisions regarding political candidates. This desire for non-interference from the landlord was intensified after land reform. A similar feeling was expressed regarding religion and church matters. However, they

believed that landlords should prefer tenants who were known to be religious.

On the social and recreational sphere, ambivalence was again manifested as to what the role of the landlord should be. Although they believed that the landlord should consider his tenants' families as extensions of his own family circle, they rejected the idea of the landlord's worrying about his tenants' recreational needs and his leading tenants in social affairs. As a matter of fact, they would like to see the landlord ready to join social affairs when invited by the tenants but not for him to lead them or to exercise sanctions in such social affairs. In a way, it was a kind of reverse snobbery! They did not go for selective social mingling between tenants' and landlord's children. On the other hand, they were divided as to whether their wives and children should get together and mix socially with the landlord's wife and children and whether the landlord should provide recreational facilities.

As far as education of the tenants' children was concerned, the expectation was for noninterference on the part of the landlord and nondependence on him for material support for the purpose, but half of the respondents did not agree that the landlord should not concern himself with the education of his tenants' children. Half of them also ascribed to the landlord the advisory role regarding the necessity of sending children to school.

One generalization which might be derived from Lopez' data on tenants' perceptions of the landlord's role is that tenants seemed to be in the twilight zone where they want to "have their cake and eat it too." This was the manifestation of a transitional phase in the relationship between the landlord and tenant and therefore, role definitions were also in the process of changing. While they perceived certain advantages in the new relationships they also seemed to be aware of the social costs involved and, therefore, wanted to hang on to the advantageous features of the "old system." This is quite obvious in their desire for independence of action and decision-making on the farm but at the same time they expected continuing welfare services and certain personalistic considerations from the landlord. It is very interesting to note, for example, that 86 percent of the tenant-respondents thought that the landlord should just let the tenants decide how to cultivate the land and what variety to plant in the field but 44 percent of them considered it the landlord's role to inform them about better farming techniques and what variety to plant in the field.

Those who endorsed this "information role" of the landlord was reduced to 37 percent after land reform. The desire of the tenants, however, to be left to decide how to cultivate the land and what variety to plant was strong whether before or after land reform. On the whole, the changes in the perception of the landlord's role from pre-land reform to post-land reform tended to be in the direction of a desire for greater independence from the landlord.

As regards the role expectation of share tenants, genuine lessees and compromise lessees, the first group showed a significantly greater expectation that landlords should provide extra funds and should help them in case of difficulties. The genuine lessees expected the least from the landlord. Those on a compromise leasehold had less expectation than the share tenants but greater than the genuine lessees. In general, the share tenants were more paternalistic in their expectations about the landlord than the two other groups. They expected more landlord tolerance and attitudes conducive to maintaining close emotional ties with tenants. They continued to expect and thus accept the landlord's unequal treatment of tenants. Genuine lessees were least paternalistic in their expectations. The share tenants were more receptive of the landlord's innovative role on the farm as shown by their expectation that he should inform tenants about better farming techniques and rice varieties to plant and that the landlord should inspect the field personally to find out how his tenants were getting along. The latter was not a matter of distrust but more to perform the expected role of informing tenants about new farming practices.[29]

In the Institute of Philippine Culture study,[30] share tenants ranked sharing farm expenses first, providing fringe benefits second, and courtesy and pleasantness, third in their role expectations of an ideal landlord. Lessees ranked pleasantness and courtesy first and sharing farm expenses, second. Extending credit is also more important to share tenants than to lessees. Again, the increased independence of the lessee from the landlord is reflected in his enhanced self-respect which expects a pleasant and courteous treatment from his landlord. The landlords themselves consider being discourteous, unpleasant and not extending credit to tenants as characteristics of an undesirable landlord. Industriousness and honesty are expectations of an ideal share tenant and lessee both

[29] R. Lopez, *op. cit.*

[30] R. P. de los Reyes, *op. cit.*

from the point of view of farmers and landlords. These two qualities assume significance in the light of earlier findings cited from the Lopez' study that tenants do not think field inspection is a necessary part of the landlord's job. Another interesting observation from the IPC study is the emergence of the lease-share landlord as being more paternalistic than either the share or lessee landlord. Apparently, his increased efforts at paternalism are aimed at retaining share tenants he still has, since he has already lost about one-half of his former share tenants.

Another source of evidence on how important a sense of independence is to the farmer is Herrera's data from three villages in Gapan, Nueva Ecija.[31] When 193 farmers were asked about preference for tenure status, as to be expected, 186 out of 196 chose owner-operators; two chose share tenancy; one chose leasehold; and four did not reply. What is significant is not their almost unanimous desire to be owner-cultivators but rather their reasons for the preference. Fifty-seven percent of the farmers preferred this because of the obvious reason that they would enjoy and own all the produce from the land, but 41 percent specifically mentioned the desire to be "their own boss" as the major reason for wanting to be an owner-cultivator. Freedom of action and independence from a "boss" seemed to be as important a consideration to the farmer as increased income. The economist, however, can argue that increased income, in many ways, enables one to "buy" independence.

E. Landlord-Tenant Patterns of Decision-Making

A frequently held stereotype of share tenancy is that of a feudalistic system characterized by landlord dominance and tenant subservience. Lopez, however, argues to the contrary on the basis of findings from his study that: "the traditional share tenancy system is a joint personal partnership defined by flexible informal norms and pervaded by a degree of trust and confidence depending upon the socio-physical situation of the actors. Opinions on the extensive power of the landlord and the abuses of such powers did not find empirical support. If, however, abuses of landlord power was a matter of fact, then the abusive exercise may not be traced to the present-day partnership but elsewhere, perhaps to the preceding generation of tenants. If it was true of the preceding generation, at

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[31] R. T. Herrera, *op. cit.*

least in Central Luzon, we might say then that the power structure in the system has changed."[32]

For the purpose of this review, patterns of decision-making with respect to farming matters are of direct relevance. Table 6.19 from the Torres and Sandoval study shows that decisions on what variety to plant and fertilizer to use were made in three ways: landlord alone; tenant alone; and joint landlord-tenant. Although landlord decisions were more frequently mentioned (44) than tenant decisions (33), the situation was certainly not a monolithic exercise of power. On matters concerning time of harvesting, planting, and sharing, kind of secondary crop to plant and choosing the field for each crop, the decision was left mainly in the hands of the tenant.[33]

On individuals consulted by farmers regarding farming decisions, data from Lu's study in Table 6.20 show half of the farmers reporting consultation with the landlord on purchase of fertilizers and farm chemicals, change of rice varieties and rice production practices. This is to be expected because the landlord is supposed to

Table 6.19. Pattern of decision-making on the farm (Responses of 112 rice landlords)*

Decision made	*Decision maker*				
	Landlord	*Tenant*	*Overseer*	*Landlord and tenant*	*Tenant and overseer*
	– *Number of responses* –				
Variety to plant	44	33	12	23	–
Fertilizer to use	46	32	1	28	2
Time of harvesting	12	78	2	18	1
Time of planting	11	82	2	14	1
Time of sharing	11	67	4	12	2
Kind of secondary crop to plant	10	62	2	13	1
Choosing the field for each crop	9	63	2	13	3

Source of data: E. Bernal-Torres and P. R. Sandoval, *op. cit.*

[32] R. M. Lopez, *op. cit.*

[33] E. Bernal-Torres and P. R. Sandoval, "Landlord Participation in the Farm Business," *Philippine Agriculturist,* Vol. 51, June 1967, pp. 65-66.

Table 6.20. Individuals consulted by farmers regarding farming decisions.

Decision on farm business	Wife	Landlord	Extension worker	Other specialists
			Total N = 395	
			– Percent –	
1. Buying fertilizers	62	52	37	5
2. Where to sell agricultural products	69	4	–	–
3. Engaging in a new enterprise	73	2	2	–
4. Buying a carabao	83	7	0.2	–
5. Buying farm tools and equipment	75	6	6	
6. Buying farm chemicals	67	41	48	4
7. Where to borrow money	84	25	12	–
8. Changing new varieties	60	52	40	3
9. Changing new rice cultural practices	58	50	40	8

Source of data: Hsueh-yi Lu, *op. cit.*

share in these farm expenses. The extension worker is also consulted by about 40 percent of the farmers regarding the above-mentioned matters but what is interesting is the extent to which the wife is consulted by the farmer on decisions involving the farm. In Lopez' study (Table 6.21), more share tenants (25.4%) than compromise (12%) and genuine lessees (3%) reported actual influence by their landlords on the selection, use, and adoption of rice production practices. Only 16 percent of the total number of farmers studied reported such kind of influence from their landlord. Similar findings were reported by R. P. de los Reyes: "More than lessee landlords, share and lessee-share landlords tend to decide alone (6 vs. 27 and 11 percent) or together with their tenants (12 vs. 35 and 47 percent) what variety of seed will be planted for the rice crop. Eight out of 10 lessee landlords leave the matter entirely in the hands of their lessees. On choice of fertilizer, again share tenants are allowed much less participation than lessees. Share and lessee-share landlords, compared with lessee landlords, more often make the decision without consulting the tenant (33 and 16 vs. 7 percent) or in consultation

Table 6.21. Percent of farmers actually influenced by their landlords on the selection, use and adoption of rice production practices.

Total N = 117	*Share tenants N = 59*	*Genuine lessees N = 33*	*Compromise lessees N = 25*
		– Percent –	
Variety	25.4	3.0	8.0
Fertilizer	17.0	0.0	12.0
Pesticide	15.2	0.0	8.0
Weedicide	15.2	0.0	8.0
Straight-row	10.2	0.0	8.0
			Total
No. of farmers reporting	15	1	3 19
Percent of total	25.4	3.0	12.0 16.1

Data were obtained from R. Lopez, *op. cit.,* Table 45, p. 241.

with him (30 and 37 vs. 0 percent). Nine out of 10 lessee landlords leave the choice to their tenants." Time of planting was decided by the tenants; harvest time, tenants alone or in consultation with landlords. One-fourth of share landlords, one-sixth of the lessee-share, and none of the lessee landlords reported making decisions on the second crop.[34]

Barker and Cordova, in a study of 30 Laguna tenants and their landlords interviewed separately, found that these two groups were in almost complete agreement as to who was responsible for decisions regarding the kind and amount of inputs to use such as fertilizer, insecticides and weedicides. In 80 percent of the cases, tenants made the decision. The landlord came to the farm only 3 or 4 times during the crop season. In only a few cases where the landlord was actively participating in the decisions that he visited the farm about once a week.[35]

[34] R. P. de los Reyes, *op. cit.*

[35] R. Barker and V. G. Cordova, Decision-Making With Respect to the Use of Inputs on Laguna Farms. Paper prepared for the Seminar-Workshop on the Economics of Rice Production, IRRI, Dec. 11-13, 1969.

A. G. Pal in her study of the adoption of IR-8 specifically asked 74 tenants whether they expected advice from the landlord on rice variety. Seventy-six percent said "Yes" and 24 percent said "No." However, only 50 percent expected to follow the advice and 39 percent said "it depends." When asked why they would follow the landlord's advice, majority (69%) of the responses focused on the element of reciprocal relations and mutual advantage such as: "he knows what is good for both of us; our relationship is good; so he cannot blame me; and he also listens or follows my advice." Deference to the landlords as owner of the land and source of initial capital was mentioned only by 31 percent. Those who would not follow landlord's advice said the decision on rice variety was up to them as tenants. A few indicated that landlord's knowledge was based on experience. Regarding amount of fertilizer to be used, 65 percent expected advice and 62 percent expected to follow advice. The most important reason for following the advice was the realization that fertilizer was good for plants and that the landlord knew what was good. Deference to the landlord as owner is only a minor reason. Reasons for saying "it depends" also revolve on the element of mutual agreement and mutual advantage. Those tenants who would not follow their landlord's advice were convinced they knew conditions better and therefore, their own judgments were followed.[36] Besides the obvious absence of a one-way dictate or advising from the landlord, the fact that 24 percent of tenants did not expect advice on rice variety and 35 percent on amount of fertilizer means the tenants were completely left alone in these matters and even when advice was expected and given, not all expected to follow and those who followed did so for reasons of mutual advantages rather than just subservience to the owner of the land.

Empirical evidence from other studies lends further support to Lopez' conclusion that the traditional share tenancy system is a joint personal partnership and that notions of the landlord's extensive power and the abuses of such powers are not empirically substantiated.

F. Tenure Status, Farm Size, Productivity and Innovativeness

The existing land tenure system in the Philippines has often been regarded as a barrier to agricultural development. It has been

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[36] A. G. Pal, *op. cit.*

usually argued that without the promise of enjoying the full benefit of their additional efforts, share tenants will not have the incentive to produce more. Typical arguments come from the anthropologist who traces the link between small farm size and low agricultural productivity in two ways:

> (a) "Crop production is insufficient under the present technology and land use to support the family entirely. Family members must all take up subsidiary subsistence and income-producing activities which in turn take time and energy from farm work. In a system of better market incentives this time and energy might be spent in additional labor that it takes to perform the technological innovations which would increase yield. (b) On such small farms even if increased production were accepted in theory, farm families cannot accumulate enough capital to make important improvements to invest in fertilizers sufficient to have a significant effect upon yields. Already living on a marginal existence, most farm families are unwilling to sacrifice anymore in consumption in order to take a chance that increased yields will result. For the *tenant,* increasing yields or improving the land is not worth all his additional efforts anyway because he still gets only half of the product. What is the use of producing for someone else's consumption? What little capital most small owners and tenants can accumulate over basic family consumption needs is not re-invested in farm development. It is spent mainly in the form of tuition fees for the education of their children so that they may have a chance to raise their status in the social system which lies outside the barrio."[37]

From the political scientist, the assessments are along the same line as illustrated in the following: "The results of low agricultural productivity are several. Most obviously, the tenant cultivator is impoverished. . . . Undoubtedly, community development is dependent upon change in the economic condition of the tenant farmers. . . the non-emerging class of farmers who have been the object of apparently futile efforts aimed at improving their conditions."[38] Another analysis leads to the same conclusion that "low productivity, lack of capital and marketing facilities weakened the small farmers and tenants and forced them to depend upon the large landowners or Chinese merchants for capital and storage facilities. Low productivity has its roots in the land tenure pattern, the social system, and the values and attitudes of the people.

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[37] James N. Anderson, *Some Aspects of Land and Society in a Pangasinan Community.* Paper read at the Seminar on Religious Acculturation, Baguio, Philippines, Jan. 1962.

[38] Louis H. Douglas, *op. cit.*

Attempts to improve productivity through extension services, research and technological improvements are hampered by the tenants' indifference and apathy."[39]

A prominent leader of a farmers' organization sharpened more directly the issue of better agricultural technology or tenure reform. As he argues: "Simple recommendations like straight-row planting may increase the harvest but need additional labor or capital. Moreover, inasmuch as the landlord will share in the increase, the farmer will get actually very little benefit – at least not large enough to give him appreciable incentive. From the viewpoint of the tenant, seed selection is not the first measure. The first measure is equitable sharing which is provided by law. Hence, to the tenant it is more urgent to enforce the Agricultural Tenancy Law than to improve seeds."[40]

Because of the contention that the prevailing tenure arrangement does not provide enough incentives for increased production in an economy where agricultural production is low and a large share of the produce goes to the landlord who is uninterested or unable to reinvest in agriculture, under the Philippine land reform program, the emphasis is on the need to shift to an owner-based agriculture. The assumption is that landownership will provide the incentive for increased productivity, since the operator will no longer share with somebody else.[41]

While social scientists and agrarian reform leaders tagged the prevailing land tenure system as a crucial barrier to agricultural development, technocrats were preoccupied with other factors. It is not the intention of this analysis to judge the rightness or wrongness of these two preoccupations but rather to review the empirical evidences relevant to the positions taken.

The Rice and Corn Study Committee which was created by President Marcos in late 1965 to recommend adequate solutions to achieve self-sufficiency in rice and corn identified in its January 8, 1966 report the basic causes of low production and productivity in rice and corn as follows: "(1) lack of irrigation water, (2) unrealistic

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[39]Jean Grossholtz, Politics in the Philippines. Little, Brown and Co., New York. 1964, p. 48.

[40]Jeremias U. Montemayor, Farmers' Organizations and Rural Development, Philippine-American Rural Development Workshop, Los Baños, Laguna, June 6-17, 1966.

[41]A. M. Wiseblat and P. R. Sandoval, *Rice Production: Institutional Factors and Economic Incentives* Paper prepared for the seminar on Studies on the Economics of Rice Production. IRRI, Dec. 8-9, 1971.

pricing and monetary policies which serve as disincentives to production, (3) ineffective communication of the technical information to the farmers, (4) inadequate credit and lack of credit supervision, (5) inefficient warehousing, milling and marketing, (6) unavailability of and high cost of agricultural production inputs and equipment, (7) poor administrative management and lack of coordination of agencies involved in rice and corn, (8) ineffective organization of producers, millers and retailers, (9) unrealistic implementation of land reform resulting in a shift from rice and corn production to other crops, (10) disastrous effect of typhoons, (11) population explosion, and (12) lack of civic conscience and national discipline."

Among the 16 guidelines for implementing the Rice and Corn Program are these three areas particularly germane to the subject under review: (a) We will concentrate manpower, technical, financial and other material resources to areas with high productive potentials for rice and corn as determined by land-use and land-capability studies. (b) We will not fight the landowners but use them as powerful ally in our rice and corn program. (c) We shall see to it that the rice and corn production program is strictly an economic development function of the Government and not a political function.

Besides identifying the "unrealistic implementation of land reform which resulted in a shift from rice and corn production to other crops" as one of the basic causes of low production the Rice and Corn Study Committee categorically stated that:

> "the primary objective of land reform is not to increase rice and corn production but rather to achieve social justice for the farmers. This means paving the way towards eventual ownership of land the farmers cultivate, doing away with unfair tenancy practices and exploitive rents, providing them with production and marketing facilities and services, and making the farmers conscious of their responsibilities in the new role they will play in the decision-making process. Actually, land reform is only one of the tools for increasing production. The implementation of a land reform program should be done cautiously, because it is an institution dealing with human beings whose attitudes and behavior cannot be changed overnight. Land reform can only be pushed through as fast as we can effect human changes. Otherwise, it would boomerang on the Administration, creating discontent instead of satisfaction."[42]

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[42]D. L. Umali, Chairman, Rice and Corn Study Committee, *A Realistic Rice and Corn Program for the Philippines.* The Committee Report, Jan. 8, 1966.

These views of the Committee were essentially supported by another technocrat whose thoughts on the subject are reflected in these statements:

"The pace of implementing the Land Reform Program as an instrument affecting effective hectarage devoted to the food crops is rather slow and perhaps rightly so, because this provides an opportunity for the lessons learned in the first land reform districts to be forged into the law and the implementation program. Rapid implementation could offset efforts to raise production in land reform areas, unless a much greater support is provided for the tenant farmers in terms of readily available credit to meet their farm needs. Partly because of preliminary research reports that production in some land reform areas decreased because tenant farmers were unable to obtain traditional financial assistance after having been weaned from their landlord, some government leaders have begun to espouse the idea that a district would be ripe for land reform only after the tenant farmers in the area have succeeded in raising their production and their income to a level that would give them a sense of real security and independence."[43]

The Filipino technocrats' views on the desirability of cautious implementation of the land reform program are not shared by a foreign agrarian reform expert who says: "Some fear that if the government overextends the land reform operations, lack of adequate supporting services might do more harm than good. This fear is rather exaggerated. The very fact of conversion of share tenants into leasehold will release considerable resources which are not presently available to farmers. The credit provided by a landlord ranges generally between ₱100 to ₱150 per hectare. On reduction of rent from the present 1/2 to 1/4 of the average normal produce (minus certain costs) the farmers will get additional resources even of a higher order as soon as he has harvested the first crop. Thus, additional financial resources will be required mainly during the period between the first sowing and the harvest."[44]

This calculation appears to be a very reasonable one except that in shifting from 1/2 to 1/4 share accruing to the landlord, the lessee shoulders all the expenses which in the old system are shared by the landlord. Furthermore, the vagaries of nature which wreck havoc on

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[43]J. D. Drilon Jr., Some Aspects of Philippine Agricultural Development An Exploratory View, *Philippine Review of Business and Economics,* Vol. 5, No. 1, April 1968, pp. 34-67.

[44]A. N. Seth, Summary of Observation on Land Reform in the Philippines. FAO Regional Office in Bangkok, 1968.

crops between sowing and harvesting set back the farmers to a negative balance, and, therefore, his credit needs are both for consumption and for production. It is precisely the unavailability of alternative sources of credit which has held back the conversion to leasehold. Another important factor which should be borne in mind is that the 25 percent rental for leasehold is a fixed percentage but the basis for deriving the percentage is a highly variable one, depending upon the average yields of the normal harvests in the three agricultural crop years preceding the establishment of leasehold.

In the years immediately after the passage of the Land Reform Code a very real issue had been: Which should come first, measures to increase productivity or the declaration of an area as a Land Reform District? In the light of this issue, the position taken by the technocrats assumes considerable significance, especially because the declaration of land reform areas was in fact, done in bits and pieces. Theoretically, if increased productivity has been effected before land reform, rentals would be high. However, in practice, it is probably fair to say that actual increased yields do not necessarily mean reported increased yields. The situation could very well be one of increased actual yield, lower reported yields and relatively low rentals depending upon the "entrepreneurial" ability of the tenant, the perceptiveness and knowledgeability of the landlord and the nature of interaction between these two forces as shaped by past and present bargaining relationships. The managing landlord who sees and knows what is going on and the absentee landlord for whom field inspection is not an acceptable function might conceivably arrive at different rentals from similar actual yields. At any rate, the determination of yields and establishment of rentals is one of the most manipulable and negotiable provisions of the Land Reform Code. As a matter of fact, in the initial period of the new high-yielding varieties, share tenants were cautioned by some lawyers to stay away from IR-8 in order not to increase yield before an area is declared a land reform area. However, the yield prospects were too great a temptation for many of them; they planted it anyway but "depressed" their yield reports.[45]

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[45]G. T. Castillo, *Miracle Rice as Produced by the Press, op. cit.* and G. T. Castillo, *Impact of Agricultural Innovation on Patterns of Rural Life (Focus on the Philippines), Agricultural Revolution in SE Asia: Consequerce for Development,* Vol. II, Asia Society 1970, pp. 13-52.

But all of these pros and cons on the relationship between the land tenure system, innovativeness and productivity are the rhetoric of the "green revolution." What we need is to look at what the empirical evidences tell us.

Baskiñas' analysis of the factors associated with adoption of recommended rice production practices among 480 farmers in 36 Laguna barrios showed no statistically significant differences among tenure groups with respect to adoption. As a matter of fact, the tendency was in the opposite direction, with owner-operators exhibiting lower adoption. Among the possible explanations for this trend are findings to the effect that share tenants and lessees had the best irrigated farms; owner-operators had the poorest irrigation. Almost half (48%) of the owner-operators were farming for home consumption; they and part-owners were engaged in diversified farming with livestock and upland crops, while share-tenants and lessees were more specialized in rice production; owner-operators had the lowest level of family labor applied on the farm; had the highest educational level not only for themselves but for their children, hence employment tended to be outside of the farm; owner-operators also had lower cash expenses and less money borrowed for the farm than share tenants and lessees; owner-operators also had lower yields per hectare.[46]

Barker *et al.*, in a study in Gapan, Nueva Ecija of 513 farms from 1965 to 1970, which was declared land reform area in 1964, found no yield differences between tenure groups although owner-operators showed lower rate of adoption of HYV and higher level of fertilizer input.[47]

The Lopez study compared share tenants, genuine lessees and compromise lessees on the extent to which they had adopted recommended rice production practices before and after land reform proclamation. Table 6.22 shows considerable increase in the overall proportion of farmers adopting the complete package of HYV, fertilizer and pesticide from 5.2 percent before and 51.5 percent after land reform. Report of no adoption declined from 22.7 to 7.2 percent. One would therefore be inclined to attribute the heightened innovativeness to the land reform program, except for the fact that all the three tenure groups exhibited the same phenomenon.

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[46]Juanita P. Baskiñas. *Factors Related to the Adoption of the Four Lowland Rice Practices.* Farm and Home Development Office, U.P. College of Agriculture, 1971.

[47]R. Barker, et al., *op. cit.*

Table 6.22. Percent of farmers adopting recommended rice production practices before and after land reform by tenure group.

	*Share tenants**		*Genuine lessees***		*Compromise Lessees****		*All farmers*	
	Before	*After*	*Before*	*After*	*Before*	*After*	*Before*	*After*
1. None	28.2	6.5	16.7	6.7	19.0	9.5	22.7	7.2
2. Pesticide only	8.7	–	10.0	3.3	–	–	7.2	1.0
3. Fertilizer only	10.9	10.9	26.7	10.0	9.5	–	15.5	8.2
4. H Y V	8.7	8.7	–	3.3	9.5	4.8	6.2	6.2
5. H Y V and fertilizer	6.5	15.2	–	6.7	–	14.3	3.0	12.3
6. Fertilizer and pesticide	34.8	13.0	40.0	10.0	52.4	14.3	40.2	12.3
7. HYV and pesticide	–	–	–	–	–	4.8	–	1.0
8. Complete package (HYV, fertilizer and pesticide)	2.1	45.7	6.7	60.0	9.5	52.4	5.2	51.5
Total N	59		33		25		117	

Before Land Reform $X^2 = 1.24$ N. S.

After Land Reform $X^2 = 1.85$ N. S.

Data were obtained from R. Lopez, *op. cit.*, Table 46, p. 242.

*Share tenants – Tenants who refuse to shift to leasehold at the time of the study.

**Genuine Lessees – Tenants who were pure lessees as per R. A. 3844.

***Compromise Lessees – Tenants who shifted to leasehold under special arrangement; their landlord not covered by the above law.

Chi-square tests yielded no statistically significant differences between share tenants, genuine lessees and compromise lessees with respect to adoption of new rice production practices, although share tenants exhibited lower adoption of the complete package than lessees.

A variable related to innovativeness is the farmer's aspiration for more share of the produce per hectare. It is interesting that levels of aspiration on rice share were practically the same before and after land reform proclamation, but there are differences between the three tenure groups. The average share of the produce per hectare

aspired for was 71.4 cavans. The share tenants who aspired for more share per hectare cultivated were those who shifted later on to leasehold, hence the data in Table 6.23 show statistically significant differences between the three groups, with those who remained share tenants exhibiting the lowest aspirations; 32 percent of them wanted 72 or more cavans per hectare, while 48 percent of genuine lessees and 56 percent of compromise lessees had similar levels of aspiration.

Table 6.23. Farmers' aspirations on rice share by tenure groups.

Cavans per hectare	*Share tenants*	*Genuine lessees*	*Compromise lessees*
		–Percent–	
15 - 43	32.2	24.2	12.0
44 - 71	35.6	27.3	32.0
72 - 185	30.5	45.4	52.0
186 - 300	1.7	3.1	4.0
Total	100	100	100
Total N	59	33	25
$X^2 = 12.73$	d.f. = 4	p = 0.02	

Data were obtained from R. Lopez, *op. cit.*, Table 34, p. 217.

Data from Tables 6.22 and 6.23 are quite revealing. Although share tenants and lessees did not differ significantly in yields per hectare, what seemed to differentiate the non-shiftees from the shiftees to leasehold was the desire for increased share of the produce rather than just productivity per se. However, Lopez' findings also indicate that share tenants who had great financial alternatives (other than the landlord) available to them before land reform were the ones who shifted to leasehold. Hence, the aspiration for a greater share of the produce was accompanied by the existence of an actual means of attaining it, given financial alternatives other than the landlord from whom most lessees were automatically cut off for credit upon the shift to leasehold.

For more details on the economic effects of land reform, the Sandoval and Gaon study is the only comprehensive analysis presently available. Table 6.24 shows a decline in total cropland from 1963 to 1967-69 but an increase in effective crop area and doubling in index of double-cropping from 23.51 to 48.38 percent brought

about by improvement in irrigation systems. These increases in effective crop area appear to have occurred more among part-owners, lessees and lessee tenants than among owner-operators and share tenants. The index of double-cropping also increased much more among lessees and share-tenants than among owners and part-owners. Another trend worth noting is the disappearance of the upland crop area and the consequent increase in the lowland rice crop area.

As far as productivity and tenure status are concerned, data in Table 6.25 show that before land reform, lessee tenants and part-owners had higher yields than share tenants, lessees and owners. The latter reported the lowest yields. During the post-proclamation period 1967-68, owners exhibited the highest yields, share tenants

Table 6.24. Average utilization of cropland by tenure (550 farmers, Central Luzon).

Tenure	Total Cropland			Average Effective Crop Area			Index of Double Cropping		
	1963-65	1967-68	1968-69	1963-65	1967-68	1968-69	1963-65	1967-68	1968-69
	— In Hectares —			— In Hectares —			— Percent —		
Owner	4.35	2.52	2.25	2.04	3.10	2.32	19.69	25.78	3.83
Part-owner	2.92	3.70	3.41	3.23	4.48	3.96	10.54	22.16	18.03
Lessee	3.51	2.89	3.17	2.33	4.51	4.36	15.96	59.12	41.61
Lessee-tenant	2.00	3.50	4.88	2.09	5.10	5.38	4.45	49.08	12.38
Share-tenant	3.40	2.38	2.41	2.94	3.52	3.19	26.42	48.72	34.06
All farms	3.94	2.85	3.06	2.74	4.16	3.92	23.51	48.34	31.50
Lowland rice	2.23	2.71	2.73	–	–	–	–	–	–
Upland rice	1.71	0.05	0.02	–	–	–	–	–	–
Other crops	–	0.09	0.31	–	–	–	–	–	–

Source: P. R. Sandoval and B. V. Gaon, *op. cit.*

Table 6.25. Mean rice yield per hectare by tenure (550 farms, Central Luzon) in cavans per hectare..

Tenure	Pre-Land Reform 1963-65	Post Proclamation Period 1967-68	1968-69
Owner	41.3	53.3	49.3*
Part-owner	53.5	50.7	46.8
Lessee	45.7	51.0	51.6*
Lessee-tenant	53.6	48.3	51.0
Share-tenant	47.7	49.0	52.9*
All farms	47.0	50.5	51.1*

Tenure	Landlord's share	Net returns to farmer	Landlord's share	Net returns to farmer	Landlord's share	Net returns to farmer
	1963-65		1967-68		1968-69	
	— In pesos per hectare —					
Owner	–	221.3	–	964.2	–	161.3
Part-owner	176.0	218.9	156.7	399.6	130.2	253.9
Lessee	173.9	188.8	177.4	247.5	171.6	373.4
Lessee-tenant	264.1	33.2	255.9	187.3	254.5	171.4
Share-tenant	275.1	18.5	354.0	109.8	374.3	14.8
All farms	227.2	17.2	207.5	243.8	201.7	233.7

*Significant at the one percent probability level.
Adapted from P. R. Sandoval and B. V. Gaon, *op. cit,* Tables 2, 3, 4, 31a, and 33a.

and lessee tenants, the lowest yields. For 1968-69, share tenants had the highest yields, followed by lessees and lessee tenants. A comparison of 1963-65 and 1968-69 yields shows statistically significant difference for owners, lessees, share tenants and all farms. Part-owners and lessee tenants showed decline in yields. Based on these findings one cannot say that tenure status makes a difference in productivity despite the shift from share tenancy to leasehold. Further support for this statement is found in Table 6.26 which compares precisely the shiftees and non-shiftees. The share tenants in 1963-65 had slightly higher average yields (47.7 cavans per ha) than old lessees (45.6). As of 1968-69, those who remained share tenants achieved slightly higher yields than new lessees. However, the modest average increases for all farms from pre-land reform to post-proclamation fail to substantiate the claim that land reform measures would lead to a decline in production during the early stages. The absence of significant differences in productivity between different tenure groups and even trends contrary to the contention that share tenants would have no incentive to increase yields, lead one to re-examine the commonly held assumptions regarding the farmer's motivations. The old notion appears too simple an explanation for

Table 6.26. Comparison of crop production and disposal of shiftees and non-shiftees, before and after Land Reform Proclamation, Central Luzon, 1963-1969.

	1963-65		*1968-69*	
	Old lessees	*Share tenants*	*New lessees*	*Share tenants*
No. of farms	79	384	205	115
Average effective crop area (ha)	2.34	2.94	4.23	3.23
Average prod. per ha in cav.	45.6	47.7	51.4	52.2
	Disposition of production in percent			
Harvester's share	9.0	9.5	11.9	10.2
Seeds used	2.4	2.1	2.1	2.3
Landlord's share	26.4	41.2	20.0	42.1
Operator's share	62.2	47.3	66.0	45.4

Data were adapted from P. R. Sandoval and B. V. Gaon, *op. cit.*, Table 37.

the choices he makes and the behavior which follows.

In a preliminary report on a meticulous and systematic cross-sectional analysis of data from Nueva Ecija, R. P. de los Reyes, Mangahas and Murphy[48] found no statistically significant differences among tenure groups with respect to yield per hectare (regardless of irrigation and variety used) and area planted (1968/69-1971/72), but for the dry season of 1972-73 owner-cultivators farmed a larger area on account of better availability of irrigation facilities. One-fifth of these owner-cultivators reported owning irrigation pumps. The three tenure groups neither differed significantly in production expenses, both in labor and non-labor costs; in use of carabao and farm equipment; use of household labor on farm, off-farm and non-farm activities; and use of non-household labor whether in number of persons or number of days. The proportion of self-financed farmers was higher for owner-operators (42 percent) and share tenants (27 percent). They also obtained bigger loans from ACA/FACOMA and banks. Lessees came next in amount borrowed from these sources. In terms of credit source, amounts of loan from other sources and interest rates, the tenure groups again did not differ significantly. The ratio of livestock sold to value of rice output is about the same for the three groups. However, when it comes to net income per hectare, owner-cultivators realized the highest mean net income (wet season ₱615, dry season ₱783) followed by lessees (₱448 and ₱447), then by share tenants, the lowest (₱332 and ₱259). Data on the national level for all crops during those years show a higher proportion of lessees who were able to borrow from ACA/FACOMA and a higher proportion of owner-operators who obtained loans from the rural bank. Fewer share tenants obtained loans from both of these sources (Table 6.26).

Further insights into the problem may be derived from the lower half of Tables 6.25 and 6.26, both of which very clearly illustrate the advantages of a leasehold over a share tenancy arrangement. It is quite evident as to how much accrues to the farmer and to the landlord as far as net returns are concerned. Table 6.26 illustrates dramatically what happens to the share tenant when he shifts to leasehold. From a 47.3 percent share of the produce he moved to 66 percent share when he shifted to leasehold. The concomitant reduction in landlord's

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[48] R. P. de los Reyes, Mahar Mangahas, and F. J. Murray, Land Reform and Agricultural Development in Nueva Ecija: Report on Phase One, Ateneo de Manila, Institute of Philippine Culture, March, 1973.

share was from 41.2 to 20 percent of the produce.

All the above observations give rise to the following speculative thoughts regarding the lack of significant productivity differences among tenure groups:

(a) Those who find it difficult to accept the lack of productivity differences among tenure groups after land reform blame it on the lessees' lack of access to credit because landlords pull out from this role when tenants shift to leasehold. Data in Table 6.26 at least for the years analyzed do not bear this out. Both owner-cultivators and lessees have enjoyed more credit from a cheaper credit source. Lack of irrigation cannot be the culprit either for the lower yield performances of owner-cultivators. They actually have an advantage in this aspect. Furthermore, where the intergroup comparison is within irrigated and within rainfed areas, the no-yield difference among tenure groups still occurs.

(b) In the absence of a better explanation for this phenomenon, a naive and rather simple one is temporarily offered until a more sophisticated rationale can be found. The shift from share tenancy to leasehold does not necessarily lead to increased productivity because at least initially the lessee could attain an increase in his net returns simply by obtaining a larger share of the produce and decreasing what accrues to the landlord. What occurs is merely a redistribution which can be accomplished without increasing farm yield. This means an improvement in the status of the individual farmers without necessarily altering the yield per hectare. Another negative factor in the productivity, actual or reported, of the lessee during the transition stage, is the need to depress yields, *if not in fact,* at least in report in order to arrive at a low rental rate which will have to be fixed with the landlord via a bargaining process. As mentioned earlier, the rental rate which is based on the average yield of three preceding normal crop years is the most vulnerable and manipulable aspect of the leasehold provisions. If this proposed explanation is acceptable, what needs to be determined in the interest of achieving the national goals of increasing productivity is: At what point and what would it take for a lessee to move from a first-level goal of increasing his returns simply by an increased share of the produce to increasing his over-all farm yields as a second-level source of improved status? Data from Table 6.25 show the stable share of the landlord from 1963-65 to 1968-69 but the lessee's share increased from ₱188.80 to ₱247.50 to ₱373.40. The lessee tenant had

a slight decline in landlord's share but an upward trend in what went to the lessee himself.

Herrera's study which included 60 farmers who had shifted to leasehold, indicated that 41 percent admitted that they had benefited from the shift; 54 percent felt that both lessee and landlord gained from the new arrangement. Only 5 percent thought that it was still the landlord who had the advantage. Their reason is that "when the crop is damaged, the lessee has no share but the landlord will get something just the same even without any expenses on his part." Lessees who perceived advantages on their side stressed the fact that they would receive more of the share. Only 5 percent mentioned heightened aspiration to produce more since the rental was already fixed. Those who perceived advantages to both parties said "both receive reasonable share, 75% for lessee and 25% to landlord."[49]

(c) In the case of the share tenant, who for one reason or another, could or did not want to shift to leasehold, there appeared to be greater incentive to increase farm productivity because that was the only way he could achieve a larger share, i.e., 50 percent of 100 cavans per hectare is higher than 50 percent of 50 with expenses shared also on a 50:50 basis. In other words, the lessee's initial avenue for increased income was via a larger share of the "pie"; the share tenant on the other hand, had to enlarge the pie before his share of it can be enlarged. Table 6.25 shows that the landlord's share increased from ₱275.10 to ₱354.00 to ₱374.30 while the tenant's share went from ₱18.50 to ₱109.80 and a share decline to ₱14.80 in 1968-69. Although both parties increased their respective shares for 1967-68, Tables 6.25 and 6.26 both show a decline in the share tenant's in 1968-69.

(d) Seeing the enormous net income differences among tenure groups and between those who shifted and those who did not, economists would find it almost impossible to believe that the farmer would go through two stages in increasing his returns. Why could he not aim for the maximum returns which means not only increasing his share of the pie but also increasing the size of the pie itself so that his share of it would be even bigger? Indeed, why doesn't he? The first stage of increasing his share from shifting to leasehold is an obvious one but the experience and the studies have also shown that despite what seems obvious to us, share tenants have their "good

[49] R. T. Herrera, *op. cit.*

reasons" for wanting status quo in their tenure.

One arrangement says that farmers have been in this "feudal" state for so long that the alternatives they perceive in life are all narrowly circumscribed within this system. Another explanation relevant to this which we have neglected because of the moral judgment attached to land reform as a "good thing" is the possibility that share tenancy is not such a "bad" system and is not as feudal as we thought it was. As Lopez and R. P. de los Reyes found in their studies, landlords do not seem to behave like "tyrants" and tenants do not seem to feel "oppressed." Perhaps the Philippines is fortunate in having had its agrarian unrest long before World War II and having had instances of oppressive landlords getting it "by the neck", so to speak, literally and figuratively. The cruel and oppressive social and personal treatment of tenants by landlords (as stereotypes would have it) has not surfaced in the studies reviewed. The lessons of the past seem to have been learned well and the threat from "rebel" elements has probably protected tenants from abuse. One also hears about landlord abused by his tenants but such stories are never written about because they are against the "little" man. Intellectual and moral norms of the times are on his side as all of us acknowledge they should be.

Finally, there should be no surprise if farmers focused on increasing their share of the pie rather than on increasing the size of the pie. The former (social justice and income distribution) was always advanced as the rationale for land reform. That increased productivity will result from land reform is something which we assumed would take place. After all, isn't it the most *economic* response to the situation? That this has not yet manifested itself is, therefore, a puzzle to everyone.

From the previously cited studies of Lopez, R.P. de los Reyes and Sandoval-Gaon, one can make this inference: Since it is the landlords with bigger landholdings, more tenants and who are geographically farther away from the tenants who are more inclined to go into leasehold arrangements with their tenants, and since leasehold has brought about a larger share of the produce to the tenant, income redistribution has in fact taken place where it is most needed. This phenomenon becomes a lot more significant when one considers that there are many more tenants than there are big landlords. Conversely, it is the landlords with smaller landholdings and less other sources of income who have tended to hang on to share tenancy arrangements.

Therefore, although share tenants may have bigger net returns than before land reform, landlords also have bigger net returns, hence increased productivity may have occurred but not income redistribution. Again, however, these landlords are the smaller ones who have fewer tenants and less alternative income sources, hence there is not much to redistribute, in the first place.

Despite the disadvantages shown in the situation of the share tenants with respect to share of the produce, we must not be led to believe that he is not utilizing options outside of rice farming. Table 6.27, which compares shiftees and share tenants, shows that the share tenants are devoting a greater proportion of family labor to non-farm rather than to farm work. Shiftees put in more labor on the farm and less on non-farm. The other significant item is in capital investment. Shiftees put in more money on the land but share tenants invest more on work animals and other animals like livestock and poultry which do not have to be shared with the landlord. In terms of farm inputs, more shiftees than share tenants utilized them in 1968-69. Perhaps this is already the beginning of the second-level stage of attempting to increase income except that shiftees and share tenants are responding differently. The former are putting in more labor and inputs on the farm; the latter are devoting more time on farmwork and livestock the returns from which do not have to be shared with the landlord. Judging from these second-level developments, lessees rather than share tenants may be the source of increased productivity. Hiwatig's study of 1964 and 1966-69 lessees indicates that the earlier shiftees had higher yields per hectare, lower cost of production per cavan, and consequently higher farm incomes than those who became lessees later. Double-cropping was also more apparent in the 1964 than in the 1966-69 group.[50] Although these results may be a reflection of differences in amount of material and technical support given to lessees at the two-time periods and a product of lower lease rentals in 1964 than later, it is also possible that 1964 lessees were already at the second-level stage of income improvement while the later lessees were still in transition.

Another problematic area with respect to land reform is the role of the landlords in the introduction and/or adoption of new rice production practices. As has been previously cited, the Rice and Corn

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[50]Mario Hiwatig, Rural Levels of Living in Selected Land Reform Areas, *Philippine Agricultural Situation,* Vol. 8, Nos. 2 & 3, April-Sept., 1971, Bu. of Agricultural Economics, Quezon City.

Table 6.27. Comparative status of shiftees and share-tenants in 1968-1969 (366 farms in 7 Central Luzon provinces).

No. of farms	*Shiftees*	*Share-Tenants*
	251 (205 lessees (36 lease-tenants (7 part-owners (3 owners	115
1. Total effective crop area (ha)	4.36	3.23
2. Percent double-cropping	57.84	53.74
3. Utilization of available family labor (days per farm)		
Total days per farm	594.4	553.6
Percent distribution		
Farm work	22.6	19.0
Off-farm work	1.6	1.2
Non-farm work	15.3	20.4
Not employed	60.5	59.4
4. Average capital investment (In pesos)		
Land	5,932	5,088
Buildings	17	4
Tools and equipment	90	81
Supplies and materials	6	3
Work animals	414	514
Other animals	138	286
Total	6,597	5,976
5. Percent of farms using		
Fertilizers	93%	80%
Insecticide	67%	54%
Weedicide	39%	24%
6. Average yield per hectare in cavans	51.0	52.3
7. Landlord's share in pesos	₱182.3	₱374.4
8. Net returns to farmer	₱177.1	₱ 11.6

Data were adapted from P. R. Sandoval and B. V. Gaon, *op. cit.,* Tables 38, 39, 40, 41, and 43.

Study Committee categorically stated that one of its guidelines is not to fight the landowners but to use them as a powerful ally in the rice and corn program. A similar position has been espoused by another economist-technocrat when he evaluated land reform implementation in 1965.

"The lessons learned in land reform implementation have special relevance to the administrative and field organization, the establishment of close working relationships with tenants and landowners, and the means to providing a general process in the attainment of landownership. Land

reforms cannot be successfully implemented by ignoring the interest of landowners nor by hostile attitude to those who have long standing interest in the land."

We further recognized that an effective land reform program can be achieved only through the goodwill and cooperation of landowners.[51]

Although those measures appear to be protective of landlords' interests, considering the circumstances at that time, it was probably the most logical approach to take for purposes of encouraging production. At any rate, what is of concern in this analysis is the unintended and unanticipated consequences of such a measure. Two possible consequences are: (1) a kindling of interest in their riceland on the part of absentee and non-managing landlords because of new production potentials; and (2) an intensified management function on the part of already managing landlords.

Needless to say, managing landlords have more to do with decisions regarding farming operations than non-managing or absentee landlords. Table 6.28 shows the difference between these two types of landlords, with managing landlords exhibiting greater capital investments and adoption of more innovative farming practices. With landlords who exercise management functions, the prospects of bargaining for lower lease rentals are not very bright, since actual yields are not likely to be unknown to the landlord. Where these yields are high, the shift to leasehold would mean high rentals.

However, data before the advent of high-yielding varieties (Table 6.29) show no significant differences in farm output under landlord, overseer or tenant supervision. In 1969, a case study of a 330-hectare farm reported that the tenanted portion had an average yield of about 45 cavans per hectare, while the owner-administered and non-tenanted area had yields of 79 and 98 for two crop seasons.[52] The yield differential may be due to the desire of share tenants to "depress" yields since the farm is located in Central Luzon, a land reform area.

In the early days of IR-8, there was the accusation that landlords "forced" their tenants to plant this variety in order to increase yield and eventually lease rentals. Pal's study[53] of 74

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[51] Amando Dalisay, Agricultural Development in the Light of Development Goals and Performance 1949-1965. Research & Development Office, University of the East, Manila, Sept. 1967, p. 12.

[52] J. D. Drilon, Jr. and Ray Goldberg, The Sanchez Rice Farm. A Study prepared for the Inter-university Program for Graduate Business Education in the Philippines, 1969.

[53] A. G. Pal, *op. cit.*

Table 6.28. Important changes introduced on the farm by two types of rice landlords (1955).

Changes introduced	Landlord type: Managing Total N = 68	Landlord type: Non-managing N = 44
	Frequency of Mention	
1. Divisible inputs such as fertilizer, seeds, pest control	80	32
2. Improved cropping pattern	8	7
3. Improved rice cultural practices	18	7
4. Land improvements	55	23
5. Improved tenant-landlord relations such as change from crop-sharing to leasehold and extension of credit to tenant	3	6
6. Bought tools and equipment for the farm (tractor, thresher, irrigation pump, weeder)	31	18

Source of data: E. Bernal-Torres and P. R. Sandoval, *op. cit.*, p. 70.

farmers, 96 percent of whom were share tenants in a community not far from Los Baños, the original source of IR-8, showed that the major reason for planting the variety as early as the first season of its introduction (1966) was that they had *heard* and *seen* its high-yielding performance. Those who did not plant it then thought IR-8 was expensive to grow and they had yet to see its yield performance.

Table 6.29. Farm output under different supervision and size of operating units (1965).

Size	Landlord: No.	Landlord: Ave. yield cavans per ha	Overseer: No.	Overseer: Ave. yield cavans per ha	Tenant: No.	Tenant: Ave. yield cavans per ha
1.00 - 1.99	14	57	2	60	5	57
2.00 - 2.99	21	54	16	54	8	45
3.00 - 3.99	26	48	22	46	7	46
4.00 and above	18	46	22	47	2	40

Source: E. A. Bernal, *op. cit.*

There were those who wanted to plant it but the landlord advised against it, at least not yet. For the next dry season (1967), the most frequently mentioned reason (70%) for using the variety was its proven high-yielding performance. By that time, 7 percent of the reasons mentioned that the landlord liked the variety; the next wet season (1967), 18 percent of the reasons mentioned this factor also. Another study by Liao conducted among 155 rice farmers from Calamba, Cabuyao and Biñan in the province of Laguna found exactly the same reasons. About 90 percent of the 110 farmers who adopted IR-8 in 1967 indicated *expected high yield* as the single most important factor for the adoption. Of the 45 non-adopters, one third indicated that the most important single factor for not planting IR-8 was the landlord's decision against the variety.

In other words, if the tenants planted IR-8, it was mainly because they were convinced of its yield performance and less likely because the landlord forced them to do so. Earlier discussions on decision-making regarding farm matters indicated that the application of compulsion from the landlord in the adoption of IR-8 by the tenant was not very likely. However, the element of naivete about rental implications of increased yield could not be ruled out since at the time of Pal's study, only 51 percent of the 74 share tenants had heard about the land reform program. This community is located in Laguna province which was not a high priority land reform area and was not proclaimed till late 1969.

A more direct study of the landlord's role in the early adoption of IR-8, the first HYV released in June-July 1966, was made by Huke and Duncan in Gapan, Nueva Ecija.[54] According to the researchers, the first recipients were six owner-operators and ten tenants who received their seeds from three landowners who lived in the poblacion or town proper. The landlords indicated that they wanted the valuable seeds to be planted on their most productive land and cared for by excellent farmers. What is important to note here is the fact that these landowners live also in Gapan and therefore are more likely to be managing landlords, since their farms are located very near their place of residence. As such, increased yields are not likely to be unknown to the landlord and could be an inhibiting factor in shifting to leasehold because of increased rentals.

However, this is more inferential than empirical. Huke and Duncan found negative though not statistically significant relationships between percentages of IR-8 adopters and proportion of farmers on

[54] R. E. Huke and J. Duncan, *op. cit.*

leasehold. Apparently, adoption of IR-8 had not been enhanced by conversion to leasehold. The consistently negative correlation coefficients even indicate the contrary. The researchers' explanation for this pattern is that "leasehold operators are seldom able to acquire loans for fertilizer, pesticides and other agricultural inputs from the Rural Banks and are almost never extended credit by their landlords who, because of fixed rental, no longer have anything to gain from improved yields. In contrast, those farmers in land reform areas who have chosen to remain on a share tenancy arrangement are those working with progressive landowners. In such situation capital expenses for agricultural inputs are shared equally and credit is extended with little or no interest by the landlord. His profit comes from improved yields." Worthy of mention here is the fact that owner-operators in this study did not exhibit a higher rate of adoption than share tenants or lessees.

The innovative, facilitative and supportive role of the landlord in increasing rice production was recognized in a series of Seminars on Rice Production for landlords which were conducted in 1965 at the University of the Philippines, College of Agriculture. The main rationale for this undertaking was the assumption that "the landlord is a strong force in influencing tenants' or even non-tenants' acceptance and adoption of recommended practices in rice production." The objective was to bring to the landlords' attention the technical soundness and economic implications of the new rice technology which had been developed through research. They were regarded as effective links in the implementation of changes in rice production both as extension agents to the tenants and as providers of capital with which to implement changes. A follow-up study found positive response to the seminars. Landlords initiated field trials of new rice varieties and demonstration of recommended cultural practices. They were now willing to adopt new methods and some even went to the extent of offering token gratuities to the extension workers from the College of Agriculture because of their concern for the welfare of their farms and their tenants. Absentee landlords who attended the seminar instructed the tenants to cooperate with the extension workers on whatever improved practices were recommended. After all, these landlords who resided far from their farms usually left the management of their farms to the tenants.[55]

[55]Ligaya N. Palang, Landlord Seminar on Rice Production. Farm and Home Development Office, U.P. College of Agriculture, Dec. 1965.

Mostly due to hindsight rather than foresight, an intriguing question arises. In the long run, is the tenant better off with a progressive managing landlord or with a big absentee landlord – whose life and livelihood interests are not tied to the land? For reasons of relative naivete as to what goes on the farm, geographic distance from the tenant, less personalistic relations with the tenants and existence of alternative sources of income besides the land, the big absentee landlord has probably contributed to the realization of at least the first phase of land reform goals. For some idea of lease rentals paid by lessees in relation to yields, data from Gapan, Nueva Ecija (an area declared land reform in 1964) are presented (Table 6.30). The rental rates followed the yield trends with lessees in the rainfed barrio paying the highest rental. Except for the "tungro season," the average lessee was paying less than 25 percent of the average yields. Although the yields were much higher in San Nicolas than in the two other villages, the yield rentals were low relative to the average yield obtained in the place. While this was a definite advantage to the lessees, the percentage of farmers on leasehold in San Nicolas was almost half only of the rainfed village. San Nicolas was also the village immediately adjoining the town proper where some of the landlords resided.

One wonders whether the presence of progressive managing landlords who have smaller landholdings has inhibited the shift to leasehold precisely because of success in increasing productivity on the part of their share tenants. Doubtless this contributes to a larger share on the part of both landlord and tenant and enhanced dependence on each other. It might also be in such cases where landlords would tend to exercise persuasion through offers of additional share or privilege in order to keep their tenants from shifting to leasehold. Furthermore, *known* high yields have consequent implication for high lease rentals. On the other hand, the high rate of leasehold in Mahipon was attributed to large landholdings with several tenants but owned by absentee landlords. According to the extension worker who was a resident in the barrio for more than five years, this combination of factors had encouraged the shift to leasehold. Several tenants together had less embarrassment in approaching their landlord with whom they had not developed close personal ties because of geographic distance. For their part, the absentee landlords who hardly knew what was going on their farm anyway found it much more advantageous to have fixed lease rental.

Table 6.30. Lease rentals paid by lessees to landlords (3 barrios of Gapan, Nueva Ecija as of 1971).

Rental in cavans per ha.	*Mahipon (Rainfed)*	*Malimba (Irrigated two crops but not very effective)*	*San Nicolas (Irrigated two crops)*	*Total*
		—*Percent*—		
4.1 - 6	14	26	–	15
6.1 - 8	36	21	23	29
8.1 - 10	33	37	54	39
10.1 - 12	14	11	15	13
12.1 - 14	3	5	8	4
Total	100	100	100	100
No. of lessees	36	19	13	68
Percent of farmers in leasehold	46	23	24	35
No. of farmers studied	N = 72	N = 66	N = 55	N = 193
Ave. yield per ha in cavans				
Wet season pre-HYV	36	46	53.8	
Wet season 1970-71	43.1	48.0	78.6	
Wet season* 1971-72	13.2	7.1	36.6	

*A serious outbreak of "tungro" disease affected yields.
Data were obtained from R. T. Herrera, *op. cit.*,

In addition to land reform, the other issue raised about rice farming and the new rice technology is that of the large farmer being benefited more than the small one in terms of productivity. So far, available data from the Philippines either before or after land reform point to the contrary. Tables 6.29, 6.31 and 6.32 all indicate a negative relationship between productivity per hectare and farm size. Bernal, Ruttan, Sandoval and Gaon found the yields per hectare of riceland to be higher in smaller than in larger farm-operating units. This is so regardless of tenure status, irrigated or rainfed areas and whether before or after land reform. Barker, *et*

Table 6.31. Relationship between farm size, tenure and productivity on rice-producing farms in the Philippines, 1962.

Size of farm in hectares	*Share tenants* Yield in 44-kilo cavans per ha.	*Full Owners*
0.6 - 0.9	27.8	33.4
1.0 - 1.4	35.6	27.5
1.5 - 1.9	39.3	27.5
2.0 - 2.9	37.9	26.6
3.0 - 3.9	36.2	28.7
4.0 - 4.9	35.6	28.1
5.0 - 5.9	35.9	25.5
10.0 - 14.9	38.4	25.5

Source: V. W. Ruttan, Tenure and Productivity of Philippine Rice Producing Farms, Dept. of Agric. Econ., University of Minnesota, Nov. 20, 1965.

al.[56] also reported in a study of 513 farms that small irrigated farms consistently gave higher yields than large ones although there were no differences in the rate of adoption of nitrogen input among farm size groups. The rate of mechanization was found to be higher on larger farms. One question which Barker, *et al.* raised was the possibility of more fertile soil on the smaller farms, but in their study such information was not available and therefore the question remains unanswered.

The higher productivity of smaller farms is supportive of land reform measures which aim to remedy the very unequal distribution of landholdings, but a satisfactory explanation for the occurrence of the phenomenon is yet to be found. What are the constraints on increased productivity on larger farms? Is the rice farm by its very nature less conducive to successful management on a large scale?

G. Land Reform in the *New Society*

On October 21, 1972 President Marcos issued under Martial Law Decree No. 27 which provided for the *Emancipation of the Tenant from the Bondage of the Soil, Transferring to Them the Ownership*

[56] R. Barker, *et al., op. cit.*

Table 6.32. Mean rice yield per hectare by size, Central Luzon.

Farm size	Irrigated			Non irrigated		
	1963-65	1967-68	1968-69	1963-65	1967-68	1968-69
Less than 1.0 ha.	55.2	47.5	57.3	50.2	50.0	49.5
1.0 - 1.9	51.4	55.7	57.6	48.1	53.3	52.9
2.0 - 2.9	46.2	59.4	54.3	43.7	53.9	48.5
3.0 - 3.9	42.6	54.4	52.6	45.9	45.1	42.8
4.0 - 4.9	50.5	54.0	50.5	44.5	46.6	50.1
5.0 - 5.9	44.5	46.5	51.9	43.5	50.4	44.0
6.0 - 6.9	44.5	45.5	48.7	43.5	39.8	47.9
7.0 and above	44.5	45.5	48.7	43.5	46.8	44.3
All farms	47.6	51.3	52.1	46.7	49.6	48.5

Data were adapted from P. R. Sandoval and B. V. Gaon, *op. cit.*, Tables 12b, 13b, and 14b.

of the Land They Till and Providing the Instruments and Mechanism Therefore. This decree applies to tenant farmers of private agricultural lands primarily devoted to rice and corn under a system of sharecrop or lease-tenancy whether classified as landed estate or not. Among the provisions of this Decree are:

1. The tenant farmer whether in land classified as landed estate or not, shall be deemed owner of a portion constituting a family-size farm of five hectares if not irrigated and three hectares if irrigated.

2. In all cases, the landowner may retain an area of not more than seven (7) hectares if such landowner is cultivating such area or will now cultivate it.

3. For the purpose of determining the cost of the land to be transferred to the tenant-farmer pursuant to this Decree, the value of the land shall be equivalent to two and one-half (2 1/2) times the average harvest of three normal crop years immediately preceding the promulgation of this Decree.

4. The total cost of the land, including interest at the rate of six (6) percentum per annum, shall be paid by the tenant in fifteen (15) years of fifteen (15) equal annual amortizations.

In the case of default, the amortizations due shall be paid by the farmers' cooperative of which the defaulting tenant-farmer is a member, with the cooperative having a right of recourse against him.

5. The government shall guarantee such amortizations with shares of stock in government-owned and government-controlled corporations.

6. No title to the land owned by the tenant-farmers under this Decree shall be actually issued to a tenant-farmer unless and until the tenant-farmer has become a full-fledged member of a duly recognized farmers' cooperative.

7. Title to land acquired pursuant to this Decree or the Land Reform Program of the Government shall not be transferable except by hereditary succession or to the government in accordance with the provisions of this Decree, the Code of Agrarian Reforms and other existing laws and regulations.

Again, as crucial to the earlier Land Reform Code as to Presidential Decree No. 27 is *the average harvest of three normal crop years immediately preceding* the promulgation of the Decree. Just as before, this average figure used for determining lease rentals will now be the basis for establishing the value of the land. Therefore, yields are of critical importance. After the transfer of landownership to the tenant has taken place, it would be worth watching what impact this will have on productivity. So far, only one study conducted in 1967 among 37 owner-operators and 63 share tenants in Pampanga and Bataan has consistently shown significant differences in performance between owner-operators and share tenants, with the former using more fertilizer, chemicals and other costs, more labor input and higher yields and net returns than share tenants. This trend was observed not only among the users of HYV but also among users of other seedboard varieties and even local varieties.[57] These findings are the only unequivocal evidence in support of landownership as a positive factor in productivity as exhibited by use of more purchased inputs, application of more labor and consequent higher yields per hectare. One hopes that this type of evidence will manifest itself more frequently, continuously and consistently.

In the rhetoric focused on "the rich are getting richer, and the poor getting poorer," the assessment of benefits from increased productivity is based on comparisons between landlord and tenant, tenant and lessee and large and small farms. On the part of the farmer, however, the incentives for adopting the new technology which are more clearly identifiable are based on comparisons

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[57] IRRI, Agricultural Economics Annual Report, 1967.

between pre-and post-HYV. Table 6.33 shows that although the sharing of output from local varieties to HYV hardly changed as regards proportions accruing to different claimants of the produce, there had been dramatic increases from pre- to post-HYV as far as actual shares were concerned. Everyone had more as a consequence of the increase in the size of the pie. The share that went to operating capital received the largest increase, followed by hired labor, tenant, and landowner. If the operating capital came from the landowner, then obviously he would get that much more. If institutionalized sources of credit had been more effective and more widely utilized, then this would have resulted in greater employment of credit personnel, perhaps more farm management technicians, etc. If the farmers had been able to capitalize their own farm operations, their share of the produce would have expanded. This situation was not very prevalent however. Although the percent share of the tenant had declined from 35 to 32 percent in 1966 and 1969, what accrued to him increased 65 percent because of the increase in yield while the landlord's receipts increased only 55 percent. Even the hired laborer increased his actual receipts by 86 percent as a consequence of the HYV's.

With the issuance of Presidential Decree No. 27, other problems arose besides that of determining the amount of amortizations based on 2 1/2 times the *average harvest of three normal crop years preceding the promulgation* of the Decree. This yield determination is not likely to take place at the individual farm level where landlord and tenant can haggle about what constitutes a normal harvest. The likelihood is that it will be established at a community or area level

Table 6.33. Share of output going to specified claimants based on records of 42 farms shifting from local varieties in 1966 to HYV in 1969 Laguna, wet season.

	1966		*1969*		*Increase from 1966 to 1969*
	₱	%	₱	%	%
Operating capital	69	7	147	9	113
Hired labor	183	18	341	20	86
Tenant	348	35	540	32	65
Landowner	393	40	648	39	55
Total	993	100	1676	100	

Source: Agricultural Economics Annual Report for 1970, IRRI.

which has as yet to be specified. There is a likelihood, therefore, that the rates for irrigated and rainfed lands would differ. In this case, landlords whose lands happen to be located where irrigation systems currently exist will receive higher compensation for their land. On the other hand, rainfed lands will have lower amortizations. It will be an advantage to the tenant if public irrigation facilities are subsequently provided after he becomes an amortizing owner.

The second problem area which surfaced immediately is not entirely unanticipated if one were aware of some data from Bernal's study presented earlier in this review regarding the size distribution of landholdings. With the provision of the retention clause, the landowner's desire to till his own land became manifest. A few days after P.D. 27 was issued, there was an order prohibiting the ejection of tenants. How then can retention and non-ejection go together? The compromise solution was status quo on whatever the landlord-tenant arrangements were before P.D. 27 (presumably leasehold). But this does not solve the problem because even in the survey of nine pilot municipalities located in areas of high land reform priority due to large landholdings, 88.5 percent of the landowners and 39 percent of the area are in landholdings of below 7 hectares. (Table 6.34). The proportion of small landholdings in other areas will, therefore, be higher. Because the government had also made a commitment to strengthen the middle class besides emancipating the

Table 6.34. Distribution of landowners and area of rice and corn tenanted landholdings by size of holding in nine pilot municipalities, *1973.

Size of holding in ha	*Percentage of landowners*	*Percentage of area*
24.0 and above	2.3	35.6
12.0 - 23.9	3.4	13.0
7.0 - 11.9	5.8	12.3
Below 7.0	88.5	39.1
5.0 - 6.9	6.0	8.1
3.0 - 4.9	15.2	11.0
Below 3.0	67.3	20.0
Total	100.0	100.0

*Calamba and Biñan in Laguna; Bongabon, Zaragoza and Guimba in Nueva Ecija; Pototan and Dingle, in Iloilo; Plaridel, in Bulacan; and San Mateo, in Isabela.

Source of data: Department of Agrarian Reform.

tenant, the retention clause posed a dilemma. Could we have both? The 1970 estimate made by the Department of Agrarian Reform was about one million rice and corn tenants cultivating 1,767,200 hectares of land (Table 6.35). At an average of 3 hectares per owner based on the preceding table, there were approximately 589,066 landowners more than 60 percent of whom were small.

Based on the requirement that all landowners submit sworn declaration of landholdings by June 30, 1973, Prosterman proposed a system for a revised retention limit which he summarized in the following manner:

"A seven-hectare retention area will give total or substantial exemption to over 90 percent of the landlords, but will confer benefits on only about 25 percent of the tenants. A variable exemption, ranging from about 1.5 to 3.0 hectares, and fixed on a province-by-province basis after the landlord's declarations are submitted, will still give total or substantial exemption to 66% to 75% of the landlords but will confer benefits on 70% or more of the tenants. The size of the exemption and the benefits conferred on tenants, will be closely comparable to those of the major land reform programs of Japan, South Korea and Taiwan." Prosterman argues that if the seven-hectare retention area is preserved, "it is mathematically inevitable that land reform will be destroyed."[58]

The new Agrarian Reform Program promises more funds. Before Martial Law, the largest authorized appropriation was ₱270 million in 1964. For the fiscal year 1972-73, the program of expenditures was ₱327,838 million; ₱813 million for 1973-74 and ₱1,093,355 million for 1974-75 (Tables 6.36 to 6.38). The bulk of the expenditures was expected to be for roads, bridges, irrigation, and for production credit requirements. All of these could be expected to have positive effects on productivity, although actual outcomes remain to be seen. Two major areas of program implementation are:

(1) Operation Land Transfer which includes identification of rice and corn tenants and their respective landowners, mapping of the corresponding parcels of farm land and the distribution of Certificates of Land Transfer. These documents simply restate the terms provided for in P.D. No. 27 whereby the tenant is deemed to be the owner of a parcel of land described in the certificate which is going to be paid for in 15 equal annual amortizations at a cost as fixed

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[58]Memorandum from R. L. Prosterman dated April 19, 1973 on "Revising the Approach to the Retention Limit."

Table 6.35. Estimated number and area of tenanted palay and corn farms by region and by province, 1970.

Region/Province	PALAY		CORN		TOTAL	
	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)
REGION I						
Abra	5,801	8,382	221	259	6,022	8,641
Benguet	906	1,362	9	10	915	1,372
Ilocos Norte	28,640	28,027	39	29	28,679	28,056
Ilocos Sur	15,064	19,404	178	192	15,242	19,596
La Union	15,742	19,799	31	37	15,773	19,836
Mt. Province	447	426	5	3	452	429
Total	66,600	77,400	483	530	67,083	77,930
REGION II						
Batanes	–	–	3	3	3	3
Cagayan	22,201	44,257	4,020	6,849	26,221	51,106
Ifugao	590	781	9	11	599	792
Isabela	27,518	64,874	3,722	6,193	31,240	71,067
Kalinga-Apayao	2,432	4,510	40	65	2,472	4,575
Nueva Vizcaya	7,655	11,018	193	322	7,848	11,340
Quirino	1,304	2,160	34	66	1,338	2,226
Total	61,700	127,600	6,021	13,509	69,721	141,109

Table 6.35. (Continuation)

Region/Province	PALAY		CORN		TOTAL	
	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)
REGION III						
Bataan	5,487	14,555	–	–	5,487	14,555
Bulacan	29,558	66,218	34	88	29,592	66,306
Nueva Ecija	61,712	170,530	509	957	62,221	171,487
Pampanga	25,323	73,829	112	272	25,435	74,101
Pangasinan	61,144	96,786	1,403	2,168	62,547	98,954
Tarlac	25,075	61,672	52	89	25,127	61,761
Zambales	8,501	13,910	–	–	8,501	13,910
Total	216,800	497,500	2,110	3,574	218,910	501,074
REGION IV						
Batangas	32,902	43,316	716	1,112	33,618	44,428
Cavite	15,756	29,260	42	106	15,798	29,366
Laguna	11,742	18,309	301	774	12,043	19,083
Marinduque	2,876	3,594	57	82	2,933	3,676
Occ. Mindoro	11,495	17,464	251	108	11,746	17,572
Or. Mindoro	14,450	24,050	357	870	14,807	24,920
Palawan	1,360	1,855	5	8	1,365	1,863
Quezon	11,143	15,564	41	66	11,184	15,630
Rizal	7,676	8,188	8	9	7,684	8,197
Romblon	3,200	5,312	36	54	3,226	5,366
Total	112,600	166,912	1,814	3,189	114,414	170,101

Table 6.35 (Continuation)

Region/Province	PALAY		CORN		TOTAL	
	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)
REGION V						
Albay	23,017	36,180	293	431	23,310	36,611
Camarines Norte	2,318	4,910	12	17	2,330	4,927
Camarines Sur	43,416	78,441	310	618	43,726	79,059
Catanduanes	676	945	33	49	709	994
Masbate	5,772	15,978	4,472	7,632	10,244	23,610
Sorsogon	7,301	10,946	109	143	7,410	11,089
Total	82,500	147,400	5,229	8,890	87,729	156,290
REGION VI						
Aklan	5,452	8,189	76	117	5,528	8,306
Antique	8,481	10,892	57	96	8,538	10,988
Capiz	22,926	34,595	134	313	23,060	34,908
Iloilo	49,406	89,705	1,443	2,553	50,849	92,258
Negros Occidental	24,629	43,363	13,471	18,654	38,100	62,022
Total	110,894	186,749	15,181	21,733	126,075	208,482
REGION VII						
Bohol	14,815	13,047	1,830	2,241	16,645	15,288
Cebu	1,759	981	46,431	54,946	48,190	55,927
Negros Oriental	4,185	6,277	24,425	40,099	28,610	46,376
Siquijor	221	262	1,090	1,027	1,311	1,289
Total	20,980	20,567	73,776	98,313	94,756	118,880

Table 6.30 (Continuation)

Region/Province	PALAY		CORN		TOTAL	
	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)
REGION VIII						
Northern Leyte	37,283	34,610	11,632	20,420	48,915	55,030
Southern Leyte	2,691	1,931	198	242	2,889	2,173
Eastern Samar						
Northern Samar	15,852	19,931	668	803	16,520	20,734
Western Samar						
Total	55,826	56,472	12,498	21,465	68,324	77,937
REGION IX						
Sulu	2,422	5,162	9	20	2,431	5,182
Zamboanga del Norte	1,856	3,346	4,569	8,876	6,425	12,222
Zamboanga del Sur	8,786	21,601	11,218	28,629	20,004	50,230
Total	13,064	30,109	15,796	37,525	28,860	67,634
REGION X						
Agusan del Norte	5,745	9,096	2,365	5,072	8,110	14,168
Agusan del Sur	655	1,154	266	633	921	1,787
Bukidnon	3,867	7,537	3,765	10,356	7,632	17,893
Camiguin	127	145	244	651	371	796
Lanao del Norte	9,204	12,133	7,483	13,404	16,687	25,537
Lanao del Sur	3,495	6,809	72	153	3,567	6,962

Table 6.35 (Continuation)

Region/Province	PALAY		CORN		TOTAL	
	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)
Misamis Occidental	6,331	5,368	1,533	2,949	7,865	8,317
Misamis Oriental	1,089	1,390	2,410	5,919	3,499	7,309
Surigao del Norte	3,078	5,350	9	15	3,087	5,365
Surigao del Sur	5,909	10,518	37	112	5,946	10,630
Total	39,500	59,500	18,184	39,264	57,684	98,764
REGION XI						
Cotabato	17,951	41,570	5,146	14,435	23,097	56,005
Davao del Norte	1,565	2,451	5,615	9,640	7,180	12,091
Davao Oriental	638	1,376	2,129	5,258	2,767	6,632
Davao del Sur	4,228	6,336	19,328	40,676	23,556	47,012
South Cotabato	7,654	20,260	2,190	6,999	9,844	27,259
Total	32,036	71,991	34,408	77,008	66,444	148,999
GRAND TOTAL	812,500	1,442,200	187,500	325,000	1,000,000	1,767,200

Note:

1. The grand total for palay and corn and the regional figures on palay only were furnished by the Bureau of Agricultural Economics.
2. Figures on the provincial level were calculated using the BAEcon 1960 Agricultural Census and DAR Carding Operations figures.

Table 6.36. Agrarian reform program of expenditures (December 1972) for Fiscal Year 1972-1973.

Region	*Roads, bridges and irrigation (In 000 ₱)*	*Survey for proposed settlements (In 000 ₱)*	*Infrastructure for proposed settlements (In 000 ₱)*	*Direct settlers assistance for settlements (In 000 ₱)*	*Credit requirement*[1] *(In 000 ₱)*	*Total (In 000 ₱)*
I. Ilocos					3,678	3,678
II. Cagayan Valley	29,190	1,920	9,200	17,550	19,941	77,801
III. Central Luzon	19,320	660	3,000	7,020	58,811	88,811
IV. Southern Tagalog		369	1,406	4,387	6,860	13,102
V. Bicol	20,970				14,961	35,931
VI. Western Visayas					26,010	26,010
VII. Central Visayas					6,105	6,105
VIII. Eastern Visayas					9,942	9,942
IX. Western Mindanao					9,090	9,090
X. Northern Mindanao	46,820				5,303	52,163
XI. Southern Mindanao					5,205	5,205
Total	116,300	2,949	13,686	28,957	165,906	327,305

[1]Under the assumption that credit requirement for rice production is ₱300/ha. and for corn production, ₱ 150/ha.
Source of Basic Data: Department of Agrarian Reform, *Philippine Agrarian Reform Program,* December 1972.

Table 6.37. Agrarian reform program of expenditures (December 1972) Fiscal Year 1973-1974.

Region	*Roads, Bridges and Irrigation (In 000 ₱)*	*Survey for Proposed Settlement (In 000 ₱)*	*Infrastructure for Proposed Settlements (In 000 ₱)*	*Direct Settlers Assistance for Settlement (In 000 ₱)*	*Credit Requirement*[1] *(In 000 ₱)*	*Total (In 000 ₱)*
I. Ilocos					4,864	4,864
II. Cagayan Valley					11,910	11,910
III. Central Luzon	32,870	496	2,160	5,265	67,394	108,185
IV. Southern Tagalog	70,140				30,587	100,727
V. Bicol					7,813	7,813
VI. Western Visayas	160,000				30,967	191,047
VII. Central Visayas	13,800	1,550	6,750	17,550	15,764	55,414
VIII. Eastern Visayas					4,020	4,020
IX. Western Mindanao		1,680	8,090	15,795	7,125	32,690
X. Northern Mindanao	97,620	3,100	13,500	35,100	20,484	169,804
XI. Southern Mindanao	54,030	3,140	13,800	35,100	20,459	126,529
Total	428,540	9,966	44,300	108,810	221,337	813,003

[1]Under the assumption that credit requirement for palay production is ₱300/ha. and for corn production, ₱150/ha.
Source of Basic Data: Department of Agrarian Reform, *Philippine Agrarian Reform Program,* December 1972.

Table 6.38. Agrarian reform program of the Philippines (December 1972) for Fiscal Year 1974-1975.

Region	*Roads, Bridges and Irrigation (In 000 ₱)*	*Survey for Proposed Settlements (In 000 ₱)*	*Infrastructure for Proposed Settlements (In 000 ₱)*	*Direct Settlers Assistance for Settlements (In 000 ₱)*	*Credit Requirement*[1] *(In 000 ₱)*	*Total (In 000 ₱)*
I. Ilocos					1,101	1,101
II. Cagayan Valley					1,604	1,604
III. Central Luzon					—	—
IV. Southern Tagalog	74,620	4,340	18,900	47,385	29,303	174,548
V. Bicol	24,140				4,476	28,616
VI. Western Visayas					2,355	2,355
VII. Central Visayas					255	255
VIII. Eastern Visayas					435	435
IX. Western Visayas	42,320				1,773	44,093
X. Northern Mindanao	94,910	4,390	23,600	42,997	18,108	104,005
XI. Southern Mindanao	574,910	3,100	13,500	35,100	29,733	656,343
TOTAL	810,900	11,830	56,000	125,482	89,143	1,093,355

[1]Under the assumption that credit requirement for rice production is ₱300/ha and for corn production, ₱150/ha.
Source of Basic Data: Department of Agrarian Reform, *Philippine Agrarian Reform Program,* December 1972.

by the authorities concerned at 6 percent annual rate of interest. In addition, the tenant agrees to join a Samahang Nayon (Barrio Association) in his locality. Although the Decree provided for family-sized farms of 3 hectares of irrigated and 5 hectares if rainfed, in practice the parcels being transferred to the tenants are the actual size of the plots which they are presently cultivating without any adjustments to meet the definition of family-sized farms. This, in a way, minimizes the disruptions in the existing system. Otherwise, it would not be feasible to implement land reform with the defined family-sized farms without massive openings of new settlements. At present the average farm size cultivated by tenants is less than two hectares (1.767).

(2) The second major feature of the new program is the organization of barrio associations which is being undertaken by the Department of Local Governments and Cooperative Development. These barrio associations are supposed to serve the following functions:

1. *Means of facilitating land transfer under the land reform program.* The Barrio Association will assist government workers in determining the owners and tillers of the land, the area of farms, production during past years and other essential information pertinent to the consummation of the mandatory sale contract between owner and tiller. The Barrio Association will also serve as a provisional guarantor of the installment payments of amortizing owners in the absence of a full-fledged cooperative in the area. In the event of default, the Barrio Association will have the power to take recourse on the offender.
2. *Channel for essential services provided to farmers.* The Barrio Association will serve as vital link between the sources of services and the barrio people. Agricultural extension workers from government and private agencies will work through the Barrio Association in disseminating technical information. The Barrio Association can also help agriculture credit technicians process loans of farmer members, thereby facilitating the process and reducing administrative costs.

   The Barrio Association will also serve as a delivery point in areas where supplies have to be brought to the barrio for individual farmers. At harvest time, the Barrio Association will serve as an assembly point of the produce of farmers intended for the payment of loans, installment on the land, irrigation fees or for outright sale to agencies which will pick up the produce from the barrio.

   Income-producing projects being carried out on a pilot scale can also be undertaken through the Association.
3. *A means of capital build-up and savings.* A key economic function of

the Association is to encourage continuous savings. The ultimate objective then of the Barrio Association is to be able to accumulate funds which are intended for specific purposes. Every member of the Association will be required to participate in a savings program. Every farmer provided a loan by the rural bank or ACA will have a forced savings of 5 percent of the loan. These savings will serve as the reserve funds of the farmer, the capitalization of a full-fledged cooperative organized among members of Barrio Associations or as source of payment for shares of stock of rural banks.

4. *A means of undertaking effective and continuous cooperative education among its members.* The Barrio Association represents the stage where cooperative concepts and practices are learned in a meaningful, concrete way. This training is crucial if the members of the organization are to eventually form themselves into a full-fledged cooperative. A systematic program of cooperative education employing various methods and materials will therefore be carried out among the members of the Association.
5. *An exercise in formal organization and self-government.* Through the Association, the barrio people are educated in the dynamics of group action. The Association will help identify or crystallize leadership in the barrio and will enable this leadership to establish necessary relationship with the rest of the people. Members will learn their rights and duties, either as individuals or as part of a specialized group in the organization, such as in a committee. Leaders, in turn, will be able to exercise their talents and realize their responsibilities as officers. This whole process will strengthen community consciousness or belongingness and will foster self-reliance.
6. *A transition step towards a more formal economic institution.* One or more Barrio Associations can initiate the organization of a full-fledged cooperative at the multi-barrio or municipal level, provided these associations have satisfactorily achieved the basic purpose for which they were organized and are able to meet given requirements. The capital accumulated by Barrio Association members will serve as the initial capital of the cooperative which can centralize all economic activities of the barrio-based organizations such as area-wide production activities, supply distribution, marketing of products, savings and loans, and any other desired activity that the cooperative is capable of undertaking.

A nationwide survey conducted by the Department of Agrarian Reform in April 1973 found that only half of the 772 farmers in the sample were aware of P.D. 27. However, those who were aware thought the program would be beneficial to them. Although they were aware that the land which would be transferred to them would

have to be paid, only about 30 percent had some notion of how the amortization would be determined. The widespread desire to own land was expressed by negative responses to the question: "Do you have farmer friends who do not want to become owners of the land they till?" However, in Eastern Visayas, Western and Northern Mindanao the positive replies were about 19 and 15 percent, respectively. Lack of operating capital was expected as the main problem. Landlord opposition to the program was also reported by the farmer-respondents. Only 117 of them said their landlords were in favor. Negative reactions were found regardless of size of holdings.

Perhaps, there is something to the speculation that the willingness of bigger landlords to shift to leasehold earlier might be due to their transfer stage. Now that it is really on hand, parting with their land has become difficult.

R. P. de los Reyes challenges the assumption that to be a landowner is the average farmer's desire. Citing the 1971 IPC study in Nueva Ecija, she points out that only a small minority of farmers seriously wanted farm ownership. Their 1973 data also seem to indicate reservations about becoming amortizing owners. Again, the problem of capital, especially after successive bad harvests, is the most frequent reason cited.[59]

It appears that the desire to own land per se would be prevalent but the desire to be an amortizing owner is a different matter. Some people will interpret this as an attitude of dependence and subservience as a consequence of feudalistic experiences. Although this is an explanation, it is not a very acceptable one.

From the point of view of the tenant, the risks involved in embarking on amortization are very great indeed. As a share tenant, he has an established *exchange* relationship with the landlord and although there are no registered formal contractual papers, the chances of his being ejected or of losing his right to cultivate the land on account of unpaid loans are indeed very slim. Under the proposed amortizing scheme, a series of bad harvests and inability to pay his indebtedness could lead to loss of the land. The insecurities on his side are, therefore, not inconsequential and the reluctance of some tenants to fully embrace their "emancipation" is understable. In the past, the risks had always been shared with the landlord, now the risks are theirs alone.

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[59] R.P. de los Reyes, *op. cit.*

The lag between legal expectations for reform and the actual changes in tenure status is evident in the data from Table 6.39. The percentage of tenant farms remaining as share tenants was about two-thirds in 1970 (Bureau of Agricultural Economics) and one-third in 1972, as reported by the Department of Agrarian Reform. What is worth noting is the high percentage of share-tenancy residuals in some regions such as the Ilocos, Eastern Visayas and Northern Mindanao. These regions have had low priority and low level implementation as shown in Table 6.6 using data in 1967. But whatever set of figures we take, the reality of land reform lies in the personal contracts and compromises between landlord and tenant. Whether it is a sharing, lease or amortizing arrangement, the agreed-upon payment whether in cash or in kind is a fundamental element which is based on yields which are, in turn, affected by technology either positively or negatively.

Table 6.39. Distribution of rice and corn tenant farms, by tenant status (based on two different data sources).

Region	Department of Agrarian Reform Program				Bureau of Agricultural Economics (1970)	
	Tenanted Farms (In Thousands)	Lessees Prior R.A. 3844 and R.A. 6389	Lessees by operation of law	Share Tenant as a Residual	Ratio of Share Tenant Farms to Total Non-Fully Owner-Operated Farms	
		—Percent—			—Percent—	
1. Ilocos	67.1	1.2	40.2	58.6	42.0	
2. Cagayan Valley	69.7	2.5	61.6	35.9	57.5	
3. Central Luzon	218.9	11.2	69.9	18.9	60.1	
4. Southern Tagalog	114.4	3.4	61.6	35.0	72.8	
5. Bicol	87.7	3.0	49.5	47.5	61.7	
6. Western Visayas	126.1	5.5	70.9	23.6	52.4	
7. Central Visayas	94.8	0.5	80.8	18.7)	62.4	
8. Eastern Visayas	68.3	1.8	47.5	50.7)		
9. Western Mindanao	28.9	1.6	83.3	15.1)	67.8	Northeastern Mindanao
10. Northern Mindanao	57.7	1.3	48.4	50.3		
11. Southern Mindanao	66.4	1.4	76.8	21.8	70.2	South Western Mindanao
Philippines	1000.0	4.4	63.8	31.8	60.6	

Source: Dept. of Agrarian Reform, Feb. 1972 and Bureau of Agricultural Economics, 1970.

7

Credit, Cooperatives and Other Organizational Components of Rice Production

Rice farming and its accompanying tenancy system has often been characterized as an unending cycle of indebtedness. One such impassioned description comes from Ladrido:

"The small farmers that compose the bulk of the farm population have not played a significant role in Philippine agricultural development because their productive capacities have been curtailed by debts, which in most cases, are held over from previous generations and perhaps carried over into the next. The onerous nature of the credit conditions involved which virtually keeps the debt running for long periods beyond redemption constitutes the danger of rural indebtedness. Wallowing in debt, the small farmer realizes that he has lost control of his land and the price and free disposal of his crops. The burden of his debt has gnawed at the meager income of the farmer, keeping agricultural progress and prosperity and ultimately the social and economic development of the country from moving forward."[1]

Ironically, however, the study in which these introductory statements appeared dealt mainly with large farmers who use credit for farm mechanization purposes. They are far from the type of farmers whose sad plight he has described with great sympathy.

Because credit has been tagged as a major problem, development programs aimed at improving the life of the rice farmer have always included attempts to get them organized in some form usually with a focus on credit as one of its important functions. Credit and organization assume even greater significance because both are regarded as vital factors in the income distribution and productivity objectives of development. In view of the several and repeated efforts

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[1]Eugenio P. Ladrido, An Economic Evaluation of the CB:IBRD Farm Mechanization Lending Program. ACCI – Dept. of Rural Banks, Central Bank, 1969.

to solve the credit problem via institutional and organizational means, this paper will review the following:

(1) The role of credit in the adoption of new rice technology
(2) Credit behavior, credit recipients and sources of credit
(3) Credit and tenure status
(4) Experiences with rice farmers' organizations

A. Credit and the Adoption of New Rice Technology

With the introduction of new technology and its accompanying package of purchased inputs, credit for production purposes has assumed an important role. While before, credit was regarded as a resource needed to meet crisis and emergency situations, the definition of a progressive farmer has shifted away from "absence of debts" to one who has good harvest and good income from farming and one who adopts modern farming practices.[2] The latter requires additional financial outlay for production purposes but with the promise of higher yields. In other words, there is more risk-taking involved with the greater investments in rice production. To meet these new requirements, credit has to be resorted to. Studies done in the 1950's and 1960's report a high percentage of farmers using short-term credit. For example, de Guzman, from a 1955 country-wide survey of 5,144 farmers over fifty percent of whom were rice farmers, found that 74 percent used at least one form of credit.[3] Gapud reported that over 90 percent of farmers in his 1958 Nueva Ecija study had short-term loans.[4] The Philippine Statistical Survey of Households in 1961 which looked into borrowing practices showed that 45.2 percent obtained loans of some kind.[5] In 1968, a study in 36 Laguna barrios found 80 percent of rice farmers borrowing for production.[6] A 1972 study of Nueva Ecija farmers reported about two-thirds being indebted.[7]

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[2]G. T. Castillo, *et al.*, The Green Revolution at the Village Level, *op. cit.*

[3]Leopoldo de Guzman, An Economic Analysis of the Methods of Farm Financing Used on 5,144 Farms, *Philippine Agriculturist,* Vol. 41, Jan. 1958, p. 467.

[4]Jose P. Gapud, Financing Lowland Rice Farming in Selected Barrios of Muñoz, Nueva Ecija, *Economic Research Journal,* September 1959, pp. 78-79.

[5]Bureau of Census and Statistics, Borrowing Practices of Farm Households, May 1961, *PSSH Bulletin Series No. 12,* June 1963, pp. XIII-XIV.

[6]Farm and Home Development Office, Rural Change in a Philippine Setting, *op. cit.*

[7]R. Pahilinga-de los Reyes and Frank Lynch, Reluctant Rebels: Leasehold Converts in Nueva Ecija, *Philippine Sociological Review,* Vol 20, Nos. 1-2, Jan.-April 1972, pp. 7-78.

Based on the results of these studies, the percentage of farmers who were indebted for production and/or non-production purposes had not changed much from the 1950's to the 1970's. The more significant change was in the amount of indebtedness for production purposes. Table 7.1 shows the increase not only in the number of tenants receiving loans from their landlords but also a corresponding increase in the amount borrowed per hectare for production inputs.

Table 7.1. Loans by landlords to tenants on specific items, Laguna 1965 vs. 1969 (30 tenants).

Item	1965		1969	
	Number reporting	Pesos per hectare	Number reporting	Pesos per hectare
Fertilizer	17	26.85	23	58.15
Chemicals	9	4.92	23	16.19
Land preparation	0	0	14	102.55
Transplanting	13	33.14	19	50.40
Weeding	4	15.30	8	57.17
Others	1	39.0	10	63.38*

*Mostly fuel for irrigation pumps.

Source: Randolph Barker and V. C. Cordova, "Decision-Making With Respect to the Use of Inputs on Laguna Farms." Paper presented for the Seminar-Workshop on the Economics of Rice Production in the Philippines, IRRI, Dec. 11-13, 1969.

Data from Herrera's study[8] in three Gapan villages in Nueva Ecija indicate that 74 percent of the 193 farmers borrowed larger amounts for production in 1971 than in 1966; 15 percent said they borrowed more then and 11 percent borrowed about the same amount. When asked about the ease of repaying credit in 1966 compared to 1971, about 42 percent felt that the burden was the same, 21 percent thought it was *more of a burden then,* but 37 percent believed that it was easier to repay credit then. The major reason for saying that repaying credit in 1966 was more of a burden than in 1971 was the low yield and low income received at that time. Those who felt that credit was less of a burden then, than it was in 1971 gave good yield and lesser amount borrowed as their reasons. Those who saw no change in the burden of repaying credit (42 percent) had borrowed more but got higher yields, hence the situation was about the same for them. In response to a question on what they considered as the

[8] R. T. Herrera, *op. cit.*

biggest problem in rice farming in 1971, 59 percent gave rice disease and pests; 51 percent said it was lack of capital for inputs; and 24 percent indicated water supply as their biggest problem. Although lack of capital for inputs was mentioned by more than half of the farmers, this does not seem to be synonymous to lack of credit because credit was mentioned as a constraint on obtaining higher yields by only 26 percent in the wet season 1971 and by 39 percent in the dry season (Table 7.2). This was quite an increase, however, from the 9 percent in 1966.

Table 7.2. Perceived constraints on obtaining higher yields (3 barrios of Gapan, Nueva Ecija).

	Wet Season = 193							
	Mahipon		*Malimba*		*San Nicolas*		*Total*	
	1966	1971	1966	1971	1966	1971	1966	1971
	—Percent—							
1. Obtaining seeds	6	4	17	35	6	27	9	21
2. Obtaining fertilizer and chemicals	1	4	11	24	–	9	4	12
3. Obtaining credit	1	4	14	45	15	33	9	26
4. Water irrigation	6	20	33	62	33	36	23	39
5. Disease, insects	1	97	29	91	51	93	25	93
6. Pests (rats)	–	4	39	85	78	93	36	57
	Dry Season (N = 113)							
1. Obtaining seeds			5	8	6	10	5	9
2. Obtaining fertilizer and chemicals			5	6	6	6	5	6
3. Obtaining credit			17	51	14	24	16	39
4. Water irrigation			94	64	48	42	73	54
5. Disease, insects			92	64	82	64	86	64
6. Pests (rats)			99	94	96	80	97	88
			Use of Credit for Production (1966)					Total
Yes		86		35		35		55
No		14		65		65		45
			Wet Season (1971)					
Yes		60		71		44		59
No		40		29		56		41
			Dry Season (1971)					
Yes				94		88		91
No				6		12		9

Source: R. T. Herrera, *op. cit.*

Apparently, when a person lacks capital, it does not mean that he himself does not have the capital or he might have some but not as much as he needs or he may not want to invest whatever capital he has on rice production. If credit were available, he may not want to borrow and not see the need to borrow. Perhaps credit is viewed as a constraint only if he wishes to use more but it is not available. Table 7.3 shows that this is the case. Although only 28 percent in the wet season and 62 percent in the dry season expressed that they could have used more credit if it were available, as expected there was a significant positive relationship between perception of credit as a constraint and the wish to use more credit, if it were available. Notably, the proportion expressing this desire increased from 28 percent in the wet season to 62 percent in the dry season. The percentage of farmers who actually borrowed for production purposes increased from 55 percent in 1966 to 59 percent in 1971 (wet season) and soared to 91 percent in the dry season of 1971. The latter crop came after the tungro infestation when harvests were meager, if not nil; therefore, there was little or no capital to finance the dry season crop (Table 7.3). The effect of this is also reflected in Table 7.2 which shows that 93 percent of the farmers regarded disease and insects as a constraint on obtaining higher yields in the wet

Table 7.3. Credit as a constraint to higher yields (193 farmers in 3 Gapan barrios, Nueva Ecija).

Perception of Credit as a Constraint to Higher Yields	*Mahipon*	*Malimba*	*San Nicolas*	Total
		Percent		
		Pre-HYV (1966)		
Yes	1	14	15	9
No	99	86	85	91
		Wet Season 1971		
Yes	4	45	31	26
No	96	55	69	74
		Dry Season 1971 (N = 113)		
Yes	–	51	24	39
No	–	49	76	61
		100	100	100

. Could you use more credit if it were available?

Table 7.3 (Continued)

	Wet Season (1971)	Dry Season (1971)
	3 Barrios	*2 Barrios*
Yes	98%	62%
No	2%	38%

Perception of Credit as a Constraint and Wish to Use More Credit, if Available

Wish to Use More Credit	Perception of Credit as Constraint			
	Wet Season		Dry Season	
	—Percent—			
	Yes	No	Yes	No
Yes	62	16	89	45
No	38	84	11	55
	100	100	100	100

Source: R. T. Herrera, *op. cit.*

season of 1971. What is most interesting in this same table is the very low proportion of farmers in rainfed Mahipon who perceived constraints on rice production except for disease and insects in 1971.

In general, for the three barrios constraints were perceived in the wet season of 1971 than the wet season of 1966. Does this mean that it was more difficult to get higher yields in 1971 than in 1966? This does not seem to be the case because the answer to a previous question asked comparing rice profits in 1970 to 1966 showed that 74 percent said they had higher profits on account of higher yields. More plausible explanations are the need for more capital to purchase inputs in the case of credit constraint; the desire to obtain the latest available HYV seeds while before, they always used what they had in the field; and the need for better quality and more dependable water supply for rice production which had become more salient with the advent of new rice varieties. In the case of disease and insect-constraints, because the number of varieties planted were reduced to only one or two which happened to be susceptible to tungro, the devastation was felt more than during the time when the risks were spread because more varieties were being grown. Furthermore, yield aspirations and expectations considerably increased because of the potential and promise of the new varieties. In order to achieve these

new yield ceilings, much more had to be done. The degree to which constraints were felt differ with wet and dry season. In general, greater constraints were perceived during the dry season, even for 1966. However, from 1966 to 1971, there was a decline in perception of constraints as far as water, disease, insects and pests were concerned.

Judging from these responses, the physical and biological problems of rice production are still the major constraints on achieving higher yields. Credit, despite all the hue and cry about it, is not as salient a constraint as perceived by farmers as water, disease, insects and pests.

Table 7.4 provides further evidence that credit is neither necessary nor sufficient for the adoption of inputs in rice production. About 20 percent of 471 farmers did not borrow money but used improved varieties, fertilizers, insecticides and herbicides. On the other hand, more than three-fourths of those who did not adopt these inputs had borrowed money. In other words, credit helps facilitate adoption but does not determine it. The lower half of Table 7.4 shows a definite positive relationship between cash expenses per hectare and the use of new varieties and other inputs. This simply means that although farmers are spending more when they use inputs they are not necessarily using credit to do so. On the other hand, those who are borrowing money are not necessarily using it to purchase all the inputs. There is no question, however, that farmers are using more production credit than in the 1960's. Among the 780 Laguna farmers, the proportion borrowing money increased from 78 percent in 1963 to 88 percent in 1968 and the average amount borrowed increased from ₱355 to ₱595.[9]

B. Credit Practices, Credit Receipts and Sources of Credit

Credit to modern man is a contractual arrangement between the borrower and the lender with respect to amount borrowed, interest rates, security and terms of repayment. However, in a traditional or transitional setting, credit carries with it a great deal of personal and informal exchange relationships. The interest rates and terms of repayments can be as varied as the variety of individual specific relationships between borrower and lender. Sanctions for non-payment are usually informal but not necessarily less effective. Tables 7.5 and 7.6 show that despite the establishment of formal credit

[9]FHDO, *op. cit.*

Table 7.4. Relationship between total amount borrowed and use of inputs
(471 lowland rice farmers in 36 barrios of Laguna, 1968)

Total Amount Borrowed (Pesos)	Wet season								Dry Season							
	Improved varieties		Fertilizers		Insecticides		Herbicides		Improved varieties		Fertilizers		Insecticides		Herbicides	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	— Percent —															
Did not borrow	20	21	22	14	22	17	17	24	21	25	21	20	20	23	19	24
Below 500	51	58	51	53	48	57	59	56	52	32	49	61	48	55	45	57
501 and above	29	21	27	32	30	26	34	20	26	43	30	19	32	22	36	19
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
N =	438	43	367	114	303	178	276	205	421	59	439	41	313	167	257	223
Cash Expenses for Crop	Relationship Between Cash Expenses and Use of Inputs															
Pesos per ha.	— Percent —															
Below 251	22	37	16	49	20	30	16	34	24	28	21	54	18	30	19	30
251 – 500	53	40	55	41	54	48	56	46	51	57	54	33	44	50	57	46
501 and above	25	23	29	10	26	22	28	20	25	15	25	13	38	20	24	24
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: FHDO-Rural Change in a Philippine Setting, UPLB 1971.

institutions such as the ACA, FACOMA, DBP, PNB and rural banks, informal sources such as landlords and private moneylenders remain important credit sources for rice farmers. Even the studies of FACOMA members in 1965-66 and of rural bank borrowers in 1962 indicate that they too borrowed from informal sources such as relatives, friends, landlords and private moneylenders. Although the

Table 7.5. Sources of farm credit (cash and kind) in percent of borrower or percent of no. of loans.

Source	*1954-55*	*1957-58*	*1962*	*1965-66*	*1968*	*1970-71*	*1971-72*
1. FACOMA, ACA, ACCFA	11.0	4.0	5.0	22.0	–	16.70	13.24
2. DBP and PNB				3.5	–	2.40	2.05
3. Rural and Commercial Banks	1.0	4.0	45.6	10.0	25.0	8.73	9.99
4. Credit Union, Loan Assoc., GSIS, SSS, etc.			11.5	0.5	6.0	0.11	1.28
Total Institutional	12.0	8.0	62.1	36.0	31.0	27.94	27.56
5. Landlords	39.0	56.0	–	64.0	20.0	9.28	10.76
6. Relatives and friends	6.0	8.0	10.3	–	25.0	24.46	25.45
7. Merchants	1.0	3.0	–	–			
8. Private moneylenders	42.0	9.0	3.8	–	24.0	38.32	37.23
9. Others, including self-finance		16.0	23.8	–	–		
Total informal sources	78.0	92.0	37.9	64.0	69.0	72.06	73.44
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources of Data:

1. L. P. de Guzman, *op. cit.*, 75% of sample were rice farms.
2. Jose P. Gapud, *op cit.*, sample size is 224.
3. Romeo A. Muere, An Economic Evaluation of a Decade of Rural Banking in the Philippines in Relation to the Development of Agriculture. Unpublished M. S. Thesis, U.P. College of Agriculture, 1965.
4. Adelino Ordono, "Agricultural Credit in Land Reform Areas," *Economic Research Journal,* (March 1967, p. 248.)
5. Farm and Home Development Office, Rural Change in a Philippine Setting, *op. cit.* Sample size, 470 rice farmers in 36 Laguna barrios.
6. Bureau of Agricultural Economics Farm Indebtedness Surveys.

Note: Some of the data included in the above table were adapted from Leon A. Mears and Meliza H. Agabin, Finance and Credit Associated with Rice Marketing in the Philippines. School of Economics, IEDR, Discussion Paper No. 71-15, Aug. 17, 1971.

number of borrowers or number of loans which came from informal sources was still more than 70 percent in 1971-72, the trend over a 10-year period as shown in Table 7.6 was an increasing share of the total value of loans coming from institutional sources. It increased from 38 percent in 1960-61 to 46 percent in 1971-72. Although landlords have declined in importance as a credit source, private moneylenders remain a major creditor. The land reform program has doubtless contributed to the diminishing role of the landlord in providing credit.

In his analysis of small-farmer credit in the Philippines, Sacay made the following observations:

(1) The agricultural credit system is in the hands of the private sector.

(2) "Of the government credit agencies, the Development Bank of the Philippines and the Philippine National Bank are in no way small farmers' banks. In the DBP, the small loans constitute 78 percent of the number of agricultural loans and 24 percent of the value of loans approved from 1965-66 to 1969-70. These loans

Table 7.6. Sources of farm credit in percent of total value of loans.

SOURCE	*TOTAL LOANS IN CASH AND KIND*					
	1960/61	*FACOMA Members*	*BAE Integrated Agricultural Survey*		*BAE Integrated Agricultural Survey*	
	PSSH	*Luzon*	*Rice Farms Only*			
	All Farms	*1965/66 Rice Farms*	*1967/68*	*1968/69*	*1970/71*	*1971/72*
1. FACOMA ACA ACCFA	1.4	36.0	13.3	13.7	21.10	17.88
2. DBP	7.9		4.6	1.9	21.00	9.31
3. PNB	17.8	18.0	—	—		
4. Rural and commercial banks			15.7	26.5	11.02	18.29
					—	0.10
5. SSS, GSIS and other insurance companies	1.2	—	—	—	—	—
6. Loan assoc. and credit unions	1.2	1.0	—	—	.02	0.20
7. Total institutional credit	38.0	57.0	33.6	42.1	53.04	45.78

Table 7.6 (Continuation)

SOURCE	TOTAL LOANS IN CASH AND KIND					
	1960/61 PSSH All Farms	FACOMA Members Luzon 1965/66 Rice Farms	BAE Integrated Agricultural Survey Rice Farms Only 1967/68	1968/69	BAE Integrated Agricultural Survey 1970/71	1971/72
8. Landlords	14.8	10.0	25.1	19.6	9.27	8.69
9. Relatives, friends or neighbors	18.6	8.0	—	4.8	13.05	17.10
10. Rice/corn miller or merchant	7.1	4.0	34.0	29.9		
11. Other merchants	13.0				24.54	28.43
12. Professional moneylenders	2.2	21.0				
13. Others	5.6					
14. Total informal external sources	61.5	43.0	59.1	54.3	46.86	54.22
15. No source reported	0.1	7.3	—	3.6	—	—

Source: The first four columns were adapted from Leon A. Mears and Meliza Agabin, *op. cit.*

1. Philippine Statistics Survey of Households: Bureau of the Census and Statistics, *Borrowing Practices of Farm Households,* May 1961, *PSSH* Bulletin Series No. 12, June 1963, p. 247. (This survey excluded loans in kind and purchases on credit with a value less than ₱10 and daily or weekly credit purchases of foodstuffs and other daily needs, regardless of value. 58-8% of loans were made by rice farmers.)

2. Rodolfo Matienzo, A Study of Membership of Fourteen Active Rice Farmers Cooperative Marketing Associations (FACOMA) in the Central Plain of Luzon, Philippines. Unpublished M.S. Thesis, Oregon State University, June 1969, p. 46.

3. Bureau of Agricultural Economics (BAE) Integrated Agricultural Surveys 1967/68 and 1968/69. All loans reported were based on samples of 6,230 rice farms in 1967/68 and 6,946 in 1968/69.

averaged ₱2,210 while loans over ₱5,000 averaged ₱42,430. The strict collateral requirements preclude tenants and lessees from using the loaning facilities of the bank." In the case of the Philippine National Bank, 30 percent of its loans during the past 5 years went to agriculture. Of this, 78 percent went to sugar producers. By 1971 this had increased to 93 percent of all agricultural loans.

(3) Unlike the DBP and PNB, the Agricultural Credit Administration is "exclusively preoccupied with serving the needs of small

farmers. Funds are continuously pumped into the system with direct government appropriations. Its operation is not financially viable due to its perpetually poor collection performance." Its loans which are extended through agricultural cooperatives are given to small farmers on a non-collateral basis. For the past 6 years (1966-71), 72 percent of the loans were for production at the average amount of ₱618.00.

(4) Among the private commercial banks, agricultural loans mostly for post-harvest activities and relatively stable agro-industrial enterprises represent only 6 percent of total credit extended. On the other hand, "the rural banking system supplies the main bulk of credit to small farmers. Although privately owned, rural banks draw heavy financial support from the Central Bank, in addition to assistance they receive in the training of their officers and employees. Initial paid-up capital is matched on a peso-for-peso basis. The rediscounting window of the Central Bank is wide open to rural banks at preferred rates of interest. There are 539 such banks, not only a few being family-owned. The system, to a certain extent, has channeled landlord capital into the banking business, a development considered favorable to effecting meaningful land reform. Almost 90 percent of loans were channeled to agriculture in 1971. About 97 percent of agricultural loans were short-term loans for production. A significant proportion (42 percent) of these loans financed rice growing. The average agricultural loan granted by the rural banks for the period 1966-71 was ₱1,085, an amount somewhat larger than ACA loans although significantly below the DBP and PNB average."

(5) Major inequities still remain in the availability and distribution of credit. To illustrate this point, Sacay cited the following figures from Agricultural Credit Report prepared by the *Ad Hoc Committee to Study the Agricultural Credit System in the Philippines, April 15, 1972:* Of the total ₱10,741 million production loans to agriculture (1966-1971), 23.2 percent went to rice and 41.3 percent went to sugar. Of the total ₱6,563.5 million marketing loan to agriculture, 7.4 percent went to rice, 33.6 percent went to sugar. For processing, warehousing and other facilities, ₱118 million was for rice and ₱309.7 million for sugar. Data on the distribution of production credit show that of the total ₱1,728.4 million, 98.4 percent went to farms of 10 hectares or more and 1.6 percent went to farms of 0.2 up to less than a hectare. Of the 666,740 production loans granted, 91.1 percent went to farms of 10 hectares and more and only 8.9 percent went to those below 3 hectares, although 72.6

percent of the farmer-recipients are small (below 3 hectares)."[10] The agricultural credit bias, therefore, favors sugar producers and the larger farmers.

For an idea of the credit distribution (cash loans) for the rice production, Tables 7.7 to 7.10 show us the national as well as the regional picture. Several observations may be made from these four tables.

(1) The proportion of rice farms which obtained credit in cash from government sources for production purposes was only 6.6 percent for 1971 and 5.2 percent for 1972. The tables cited earlier indicate *proportion* of *farmer-borrowers* who got credit from the different sources, hence, the percentages are larger. They do not show the percentage of *total farms* which had been able to borrow. This means that regardless of the growth of institutional sources of credit, not many farmers borrow or have been able to borrow from them.

(2) Central Luzon farmers of all the regions did the most borrowing for both cropping seasons. This is understandable because

Table 7.7 Rice production program: credit, number of rice farms securing loans by source, by region, Philippines, July to December, 1971.

Region	*Number of Rice Farms*	*Loans from Gov't. Sources*		*Loans from Private Sources*	
		No.	*Percent*	*No.*	*Percent*
Philippines	1,479,434	96,947	6.6	380,190	25.7
Ilocos	129,664	4,798	3.7	8,091	6.2
Cagayan Valley	96,618	6,956	7.2	29,101	30.1
Central Luzon	307,088	42,685	13.9	140,769	45.8
Southern Tagalog	180,675	11,383	6.3	35,521	19.7
Bicol	144,477	9,381	6.5	40,656	28.1
Eastern Visayas	145,296	2,506	2.0	7,600	5.2
Western Visayas	221,817	10,647	4.8	77,414	34.9
Northern & Eastern Mindanao	89,643	2,600	2.9	15,643	17.4
Southern and Western Mindanao	164,156	5,581	3.4	25,395	15.5

Source: Bureau of Agricultural Economics.

[10]Orlando J. Sacay, Small Farmer Credit in the Philippines, *AID Spring Review of Small Farmer Credit,* March 1973.

Table 7.8. Rice production program: Number and percentage of borrowing rice farms which secured loans from government sources, by source, by region, July to December, 1971.

Region	*Total Borrowers*		*Rural Bank*	*ACA*	*PNB*	*DBP*	*Not Specified*
	No.	*%*	*– Percent –*				
Philippines	96,947	100	50.6	23.9	12.3	6.7	6.5
Ilocos	4,798	100	66.7	6.7	13.3	3.3	10.0
Cagayan Valley	6,958	100	69.8	9.3	13.9	4.7	2.3
Central Luzon	42,685	100	41.1	36.7	12.8	2.7	6.7
Southern Tagalog	11,383	100	67.9	10.7	8.6	3.6	9.2
Bicol	9,391	100	27.5	34.8	18.8	11.6	7.3
Eastern Visayas	2,906	100	14.5	35.7	14.0	28.6	7.2
Western Visayas	10,647	100	84.0	–	4.4	8.0	3.6
Northern and Eastern Mindanao	2,600	100	45.4	–	18.2	27.3	9.1
Southern and Western Mindanao	5,581	100	46.4	18.5	14.0	17.6	3.5

Source: Bureau of Agricultural Economics.

Table 7.9. Rice production program: Number of rice farms securing loans by source, by region, January to June, 1972.

Region	*Number of Rice Farms*	*Loans from Gov't. Sources*		*Loans from Private Sources*	
		No.	*Percent*	*No.*	*Percent*
Philippines	829,172	43,190	5.2	182,434	22.0
Ilocos	34,193	157	0.5	1,265	3.7
Cagayan Valley	116,816	8,574	7.3	29,858	25.6
Central Luzon	73,984	4,269	5.8	32,775	44.3
Southern Luzon	91,107	8,090	8.9	18,823	20.7
Bicol	109,141	8,011	7.3	35,504	32.5
Eastern Visayas	147,635	8,131	2.1	10,884	7.4
Western Visayas	96,826	5,122	5.3	30,403	31.4
Northern and Eastern Mindanao	69,506	2,815	4.0	7,430	10.7
Southern and Western Mindanao	89,914	3,021	3.4	15,492	17.2

Source: Bureau of Agricultural Economics.

of the region's importance as a rice-growing and as a land reform area. On the other hand, Ilocos and Eastern Visayas registered the least borrowing among their farmers. In both areas, rice is not a major crop.

Table 7.10. Rice production program: Number and percentage of borrowing rice farms which secured loans from government sources, by source, by region, January to June, 1972.

Region	Total borrowers		Rural Bank	ACA	PNB	DBP	Not specified
	No.	%	— Percent				
Philippines	43,190	100	56.3	17.8	9.5	7.8	8.4
Ilocos	157	100	100.0	—	—	—	—
Cagayan Valley	8,574	100	64.5	10.5	15.4	5.8	3.8
Central Luzon	4,369	100	43.6	44.3	4.6	—	7.3
Southern Tagalog	8,090	100	67.4	9.3	4.7	2.3	16.3
Bicol	8,011	100	48.3	31.0	10.3	3.5	6.9
Eastern Visayas	3,131	100	20.0	33.3	19.7	30.3	19.7
Western Visayas	5,123	100	83.9	—	3.0	3.4	9.7
Northern and Eastern Mindanao	2,815	100	50.0	—	7.1	33.7	7.2
Southern and Western Mindanao	3,021	100	40.0	20.4	13.3	19.3	6.8

Source: Bureau of Agricultural Economics.

(3) In general, more farmers from Luzon than from Visayas and Mindanao obtained loans from government sources.

(4) For six of the nine regions, the rural bank was the major source of credit. For Central Luzon and Bicol, both the rural bank and ACA provided loans. For Eastern Visayas, the ACA and DBP provided loans to more farmers than the rural bank and ACA. A similar pattern can be observed with the 1972 crop. It is only in East Visayas and Northern and Eastern Mindanao where one finds the highest proportion of farms borrowing from DBP. Perhaps the regional distribution and policies of these lending institutions have as much to do with this pattern as anything else.

Because the most significant finding from all these data is the very small number of farmers who obtain credit from government sources, it is important to know why this is so. Is it unwillingness or inability to borrow? A study conducted in 50 Laguna barrios provides some clues, although the farmers interviewed were not all rice farmers. Table 7.11 reveals that more than 50 percent did not borrow for production purposes. About 40 percent of the reasons for non-borrowing centered on the problems of borrowing, but 60 percent

Table 7.11. Credit behavior of 1596 farmers and farmers' wives from 50 barrios in Laguna.

	N	*Percent*
A. *Borrowing Behavior*		
1. Farmers who do not borrow for farm purposes	910	57
2. Farmers who borrow from non-official institutions like moneylenders, landlords and relatives	351	22
3. Farmers who borrow from official lending institutions like banks, credit unions and agricultural credit associations	335	21
Total	1596	100
B. *Reasons for Non-Borrowing of 920 Farmers*		
1. The farmer himself has sufficient capital.		61
2. The farmer has no collateral to offer.		16
3. He is afraid of not being able to repay the loan.		12
4. He does not know how to borrow.		2
5. He thinks nobody will lend him.		2
6. He does not borrow out of principle.		1
7. He was turned down in the past and will not try again.		1
8. No reasons given.		5
		100
C. *Source of Loans for Those Who Borrow from Non-Official Institutions (351 Farmers)*		
1. Relatives		42
2. Local moneylenders		35
3. Merchants		23
		100
D. *Reasons Given by 351 Farmers for not Borrowing from Official Lending Institutions*		
1. Tried to get a loan before but was turned down		4
2. Ignorance of the presence of an official lending institution		14
3. Too much trouble and time involved in going through the borrowing process		28
4. The terms of the bank are unacceptable to the farmers (interest or repayment terms)		10
5. No collateral to offer		36
6. Fear of not being able to repay the loan		8
		100

Table 7.11 Continuation)

	N	Percent
E. *Sources of Loans for 325 Farmers Who Borrow from Official Lending Institutions*		
1. Rural Banks	266	82
2. Commercial Banks	10	3
3. Agricultural Credit Association of Farmers' Cooperative Marketing Association	49	15
	325	100
87% of these borrowers will secure loans from these sources again; 13% will not.		
F. *Reasons Given by 33 Farmer Borrowers for Not Borrowing Again from Banks*		
1. Inability to meet obligations in the past.		60
2. They think it is easier to borrow from local moneylenders.		20
3. Interest rate of the bank is too high.		10
4. They do not like to obtain loans anymore.		10
	N = 33	100

Source: Paul Meijs, An Evaluation Research of the Philippine Rural Reconstruction Movement's Barrio Development Program in Laguna. Asian Social Institute, Manila, January, 1973.

mentioned sufficiency of capital and, therefore, there was no need to borrow.

The question is whether they really had enough capital for modern farming or they had enough capital only for subsistence farming. The latter does not require much purchased input. As expected, local moneylenders, merchants and relatives were the non-official sources of credit. The major reasons for not borrowing from lending institutions are lack of collateral and too much red tape. What needs emphasis is the 14 percent who admitted ignorance of the presence of such institutions. This lag in knowledge assumes greater significance when one considers that Laguna is a relatively well-developed province where a rural bank is found in almost every municipality. Relevant to this is the finding from the same study that 19 percent of the households were able to save. But of the savers, 55 percent of them kept their savings in piggy banks, closets or with relatives. Only 21 percent of the savers deposited their money in the

rural bank. In this regard, the compulsory savings program of the barrio associations could really bring about a change in savings behavior.

For those farmers who had been able to borrow from official lending institutions, notably the rural bank, 87 percent expressed willingness to secure loans from them again. The rest had been unable to meet obligations, did not want to use credit anymore or felt that it was easier to borrow from local moneylenders. In the light of findings from this study, the low proportion of farmers from the BAEcon data who obtained loans from government sources does not necessarily mean they could not borrow. It was entirely possible that many of them did not want to borrow. However, the proportion borrowing from private sources was four times more than those using government sources. This, therefore, tells us that institutional constraints were operating.

C. Credit and Tenure Status

Credit has always been regarded as an important function of the landlord in a situation of tenancy. When a land reform program is embarked upon, alternative sources of credit are usually sought. Table 7.12 shows that regardless of tenure status, private money-

Table 7.12 Farmer-borrowers by source of loan and by tenure (In percent of total farmer borrowers).

Source of loan	*Owners*	*Lease-holders*	*Share tenants*
1) *1970-71 Philippines*			
ACA/FACOMA	19.1	23.9	8.3
Rural banks	13.3	5.4	6.7
DBP/PNB	7.6	0.0	0.8
Landlords	–	7.8	15.9
Private moneylenders	38.2	41.5	39.8
Relatives/friends	21.8	21.5	28.2
2) *1971/72 Philippines*			
ACA/FACOMA	9.8	24.0	8.0
Rural banks	13.5	6.3	6.2
DBP/PNB	6.8	0.4	0.0
Credit unions	2.5	0.4	0.9
Landlords	–	9.7	19.4
Private moneylenders	40.9	38.7	36.6
Relatives/friends	26.5	20.6	28.8

Source: BAEcon Farm Indebtedness Surveys.

lenders, relatives and friends are the most frequently mentioned creditors. As expected, more of the share tenants obtained loans from their landlords. Contrary to expectations, lessees were not all cut off from their landlords. Of the three tenure groups, more owners and lessees than share tenants borrowed from institutional sources.

Studies in Nueva Ecija, which is a pilot land reform area, provide us with interesting details on credit and tenure status.

(1) Table 7.13 shows very neatly the diminishing role of the landlord as a provider of credit as one goes from share tenant, lessee-share, lessee, to part-owner. The percentage of farmers borrowing from landlords declined from 47 to 7 percent.

(2) Owners and lessees used institutional sources more than the share tenants but lessees used private moneylenders more than any other tenure group.

(3) Between 65 and 71 percent of the farmers showed indebtedness of some kind. Surprisingly, the share tenants had slightly less borrowers than the other groups.

(4) Fewer share tenants used production credit but more of them reported non-production loans. Owners and part-owners borrowed more than the three other groups.

(5) Although the typical image of a rice farmer is that of a perpetual debtor, data show that 12 percent of them were creditors. It is also noticeable that among the farmer-creditors, there were more share tenants and lessees than owners. Even more intriguing is the fact that half of the share tenants and lessees who were *creditors* were not *debtors,* while there were only 12 percent of owners in this situation. Farmer-creditors lent predominantly to non-kinsmen which could indicate that it could be a "business" lending rather than a family obligation.

(6) Herrera's study in Gapan also showed bigger loans for owners than lessees and share tenants. Cooperatives and government agencies (formal institutions) were the most common sources for the owner and the lessees. The tungro infestation, which affected the crop, increased considerably the borrowing during the dry season. Practically all the lessees and share tenants obtained cash loans and the private moneylender became a more important source. Data for 1966, wet season 1971 and dry season 1971 show that farmers had an increasing perception of credit as a constraint on obtaining higher yields. Lessees and lessee-shareholders more than tenants and owners

Table 7.13 Credit practices (702 rice farmers) in Nueva Ecija, 1971.

	Owner	*Part-owner*	*Lessee*	*Lessee* *Share tenant*	*Share tenant*	*Total*
				—Percent—		
Source of credit						
Institutional	60	66	33	41	13	32
Kinsmen	12	11	19	33	20	18
Landlord	–	7	20	26	47	28
Other private money-lenders	37	23	45	18	33	37
N	82	44	285	27	254	702
Percentage in debt (any kind)	70	69	71	68	65	
Kind of loan reported						
Production	51	46	49	58	36	45
Non-production	32	32	39	28	48	21
Both	8	10	9	15	9	9
None	30	35	31	32	29	31
Amount borrowed						
Production (cash)	₱1435	625	475	300	400	
Non-production (cash)	₱1080	650	435	585	375	
Tenure status of creditors						
Percentage of farmers who are creditors	14	8	38	6	35	12
Percentage of creditors who are not debtors	12	22	52	43	51	44
Percentage of creditors who lend to:						
Kinsmen	19	33	36	14	24	28
Non-kinsmen	69	66	59	86	68	66
Both	12	0	4	0	7	6

Source: R. P. delos Reyes and F. Lynch, *op. cit.*

felt the constraint. They also said that more credit could have been used if it were available. Although the lessees felt the credit constraint more than the other groups, they used government lending institutions more than the tenants, hence interest rates were lower. However, in the event of a crop failure, the share tenant had the landlord as a more dependable source of financing.

Equally important as borrowing behavior is the phenomenon of non-borrowing. Table 7.14 shows that about 30 percent of the farmers had no indebtedness of any kind, regardless of tenure status. We can assume that those were the self-financed farmers who deserve to be examined more intensively. What enabled them to be self-

Table 7.14. Production, credit and tenure status (3 Barrios of Gapan, Nueva Ecija, 1971).

	Share tenant	*Lessee*	*Owner-Operator/ Part-owner*	*Combination*	*Total*
			Wet Season (1971)		
Use of credit in cash			*Percent*		
Borrower	45	42	48	27	44
Non-borrower	55	58	52	73	56
			Dry Season (1971)		
Borrower	91	96	85	100	92
Non-borrower	9	4	15	0	8
			Amount Borrowed (cash), Wet Season		
₱ 1 – 99	51	14	12	50	33
100 – 199	24	17	24	13	21
200 – 299	18	49	24	–	26
300 – 399	8	14	18	25	13
400 – 499	2	6	12	–	5
500+	–	–	12	13	2
			Amount Borrowed (cash), Dry Season		
₱ 1 – 99	15	4	9	–	11
100 – 199	15	15	27	38	18
200 – 299	29	46	18	13	31
300 – 399	22	8	–	38	17
400 – 499	14	23	36	13	18
500 +	5	4	9	–	5
			Source of Credit (Wet Season)		
Landlord	70	6	–	50	37
Bank	2	–	6	–	2
Cooperative	–	20	35	13	13
Private moneylenders	18	20	6	–	15
Relatives and friends	10	–	18	–	7
Government agencies	–	54	35	37	26
	100	100	100	100	100
			Source of Credit (Dry Season)		
Landlord	81	8	9	20	50
Bank	–	–	9	–	1
Cooperative	2	–	–	25	1
Private moneylenders	10	35	36	25	20
Relatives and neighbors	–	4	9	13	3
Government agencies	7	53	37	17	25
	100	100	100	100	100
			Formal-Informal Sources of Credit (Wet Season)		
Informal	98	26	24	50	60
Formal	2	74	76	50	40
	100	100	100	100	100

Table 7.14 (Continuation)

	Share tenant	*Lessee*	*Owner-Operator/ Part-owner*	*Combination*	*Total*
			Formal-Informal Sources of Credit (Dry Season)		
Informal	91	46	55	62	74
Formal	9	54	45	38	26
	100	100	100	100	100
			Perception of Credit as a Constraint on Obtaining Higher Yields		
			Pre-HYV 1966 (Wet Season)		
Yes	13	5	3	27	9
No	87	95	97	73	91
			Wet (1971)		
Yes	24	30	18	45	26
No	76	70	82	55	74
			Dry (1971)		
Yes	25	63	46	62	39
No	75	37	54	38	61
			Could Use More Credit If It were Available		
			Wet Season (1971)		
Yes	33	25	12	55	28
No	67	75	88	45	72
			Dry Season (1971)		
Yes	55	78	54	75	62
No	45	22	46	25	38

Source: R. T. Herrera, *op. cit.*

financing? Were they the traditional conservative farmers who did not use purchased inputs and modern practices or were they the very progressive farmers who were able to realize sufficient profit from rice-farming as to enable them to be self-financing?

All the writings and studies on credit underscore the usurious interest rates and, therefore, moneylenders are regarded as social evils to be done away with. This preoccupation with usury has given us a lopsided picture of credit which needs to be balanced by a discussion of *interest-free loans.* Tables 7.15 and 7.16 show that although past studies reported very high average interest rates which were affected by extremes of values, there was always an unnoticed proportion of *no interest* loans. Studies report from 12 to 49 percent of loans made

as being interest-free. A significant proportion also report legal rates. What needs further investigation is the dynamics and motivations for free lending in cash or in kind. Table 7.16 indicates that landlords lend free to both lessees and share tenants whether or not they are kinsmen. Even non-landlords and non-kinsmen also practice this type of lending. Predictably, however, kinsmen even if non-landlords, have a greater inclination toward this practice. The cultural and economic dimensions of free lending have to be investigated in order to provide a more realistic appraisal of rural credit.

Part of the problem in interpreting data on credit is the difficulty or impossibility of distinguishing what the loans were used for because in many studies it is not specified. Strictly speaking, if we were to consider household indebtedness (short-term or long-term, cash or kind) for any or all purposes such as consumption,

Table 7.15. Studies indicating no interest or low interest rates on farm loans.

	Percent of loans
1. Muñoz; Nueva Ecija, 1958[11]	
No interest	20
1 – 14% rate	13
Average interest rate 98%	
2. Nationwide Survey, 1959[12]	
No interest	49
1 – 14% rate	25
Average interest rate 28%	
3. Nueva Ecija, 1969/70[13]	
5%	26.8
5 – 14%	38.2
Average interest rate 21.8%	
4. Leyte, 1971/72[14]	
No interest (1971)	12
(1972)	16
5. Cotabato, 1972[15]	
No interest	27
6. Gapan, Nueva Ecija, 1972[16]	
No interest	31

[11] J. P. Gapud. *op. cit.*

[12] L. P. de Guzman, *op. cit.*

[13] IPC-BAEcon Socio-Economic Study of Nueva Ecija, CY 1969/70.

[14] T. E. Contado and R. A. Jaime, *op. cit.*

[15] E. Kimpo, *op. cit.*

[16] R. T. Herrera, *op. cit.*

Table 7.16. Interest-free loans extended by landlords, non-landlords' kinsmen or non-kinsmen to lessees and share tenants.

	Production		*Non-Production*	
	Cash	*Kind*	*Cash*	*Kind*
	Percentage of debtors given interest-free loans			
Landlords (Kinsmen or non-kinsmen				
Lessees	6	38	12	50
Share-tenants	26	58	38	58
Kinsmen – non-landlords				
Lessees	61	80	69	67
Share-tenants	42	75	64	53
Other Individuals				
Lessees	12	0	12	33
Share-tenants	34	33	31	29

Source: Romana P. de los Reyes and Frank Lynch, *op. cit.*

production, education, medical, housing, etc. most, if not all households whether rural or urban, farm or non-farm would have indebtedness of one sort or another. Therefore, the typical description of the rice farmer as being perpetually in a state of indebtedness, may not really be peculiar to the rice farmer. What deserves detailed study are the specific settings and circumstances which affect the whys, hows and wherefores of credit.

It is noteworthy that rarely does the rice farmer complain about high interest rates as his pressing problem. This is not to say that he does not pay high interest, but perhaps from his point of view, it is important that he gets credit when he needs it even at a high price. Cheap credit which is not available to him for one reason or another is actually meaningless. What is usury to whom probably depends on how badly one needs the credit and how quickly he can obtain it. For someone who gets it when he needs it most, there may be no such thing as usury. For someone who has viable alternative sources of credit, usury can be both illegal and immoral.

Furthermore, in the credit situation, one is not always a borrower. He is usually both a borrower and a lender, perhaps not always simultaneously, but at different points in time. If one plays

the role of borrower and/or lender instead of borrower all the time, there is some opportunity to even up the score, although admittedly some will be net borrowers and some net lenders. Hence, the credit phenomenon, especially of the non-formal or non-institutional type, has to be viewed in the community rather than individual farm or household context. This is underlined even more by the fact that despite the existence of credit institutions, majority of credit needs are still supplied by informal sources.

D. Experiences With Rice Farmers' Organizations

1. *Cooperatives*

The promotion of cooperatives in the Philippines started at the national level as early as 1952 through Republic Act 281 which established an agricultural credit and cooperative financing system to assist small farmers in securing liberal credit and to provide the effective grouping of farmers into cooperative associations for the efficient marketing of their agricultural commodities. From then on, the cooperative movement has had its ups and downs. As the Bergland report describes it:

"From 1953-1957 cooperatives were organized in all areas of the Philippines and this brought into the field more than 260,000 farmers, primarily share tenants. These Farmers' Cooperative Marketing Associations (FACOMAS) with their warehouses, rice mills, and offices were made possible by ACCFA (Agricultural Credit Cooperative Financing Administration) financing and did have the impact of revolutionary change. It quieted a restless people, lifted up rural hopes and brought about a certain measure of political stability. It must be recalled that during the years following World War II and up until 1953, the plains of Central Luzon were under the grip of social upheaval. The armed HUKS were at one time threatening the city of Manila."

By 1958, the ACCFA program had collapsed and was nearly dormant by 1960. A notable explanation for this collapse was that cooperatives were generally considered to be social justice and service organizations, not business institutions. Furthermore, the program was expanded too rapidly because of political pressure. By 1963, the cooperative movement was revived with ACCFA rebaptized as ACA (Agricultural Credit Administration). Regarding its credit operations, ACA served 12,186 farmers with production

loans in 1963-64. The administrative expense for each farmer served was ₱32.27 or a loss or government expense per farmer of ₱12.92. The administrative expense was 75 centavos per peso loan and the loss from operations for every peso loaned was 30 centavos. Six years later, 1969-70, overhead expenses were reduced from 75 centavos per peso to 18 centavos per peso. The administrative loss was reduced from 30 centavos per peso loaned in 1964 to 5 centavos in 1969-70. In that same year, the ACA released production loans to 56,482 members of cooperatives for an average overhead expense per farmer of ₱14.84. The loss per farmer was reduced from ₱12.92 in 1964 to ₱3.92. The production loans increased in volume and average size from ₱2,905,000 in 1963-64 with ₱238 average to ₱30,922,000 in 1969-70 with ₱547 average loan per borrower.[17]

Despite all these changes in volume of business and improvement in efficiency of loaning operations, the cooperative movement had serious problems. The 1968 Agricultural Cooperative Development Committee had this to say on the magnitude of the task:

"In spite of recent revitalization efforts, the status of agricultural cooperatives had not significantly improved. In the case of rice FACOMAS, only 40 percent of 234 were active, 7 percent semi-active and the rest were inactive. Membership-wise, only 16 percent of the members (188,071) of rice FACOMAS were active. As of June 30, 1968 only 67 out of 94 active rice FACOMAS warehouses had net savings and 23 reflected positive net worth. Although there were 152 warehouses owned by the FACOMAS in the 15 provinces of the first priority area of the Rice and Corn Productivity Coordinating Council (RCPCC) with a total rated capacity of 3,857,200 cavans, these warehouses were utilized only up to 38 percent of this capacity." Among the problems cited in the report which underlie this state of affairs were:

(1) Since the FACOMAS in general had been promoted and organized chiefly as a medium for channelling liberal credit to farmers, the farmer-members of the FACOMAS had become credit-oriented. Consequently, most of the farmers looked upon these FACOMAS as credit agencies and not as a marketing arm for them. Their cooperative activities, therefore, were dependent on the availability of the loan funds from ACA.

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[17]Philip L. Bergland, Terminal Report, June 1965 to June 1971, Agricultural Cooperative Development.

(2) Because of this misconception regarding the principal purpose of the FACOMA, most of the members did not market their produce through it. As a result, the FACOMA was unable to generate a sufficient volume of business to make it an economically viable institution.

(3) Farmers were reluctant to join or support the FACOMAS because most of them had impaired capital. In the meantime, these FACOMAS continued to operate and incur losses. Under these conditions, the agricultural cooperative movement had failed to attract new members and had alienated the support of a number of the old members.

(4) Many FACOMAS did not have adequate facilities to perform the marketing functions which would enable them to serve their members effectively.

(5) There had been no concerted and sustained education and information campaign before and after the organization of their cooperative.

(6) The arrangement they had whereby the Agricultural Productivity Commission (the national extension service) promoted and organized while the ACA regulated agricultural cooperative gave rise to a vague delineation of activities in the matter of supervision.

(7) ACA resources at the time were insufficient to meet the credit requirements of farmers and cooperatives.[18]

A report from ACA dated June 30, 1970 showed a total of 668 cooperatives under the FACOMA. The total number of members was 367,122, the active members of which numbered 108,652. This was only 29.59 percent of the total number.

All of these reports indicate the low degree of farmer participation in cooperatives and, therefore, this approach to rural development has yet to prove itself on a substantial scale.

Warner and Hefferman, in their study of voluntary farm organizations in the United States, provide some explanatory proposition for differential participation which has relevance to farmers' associations and cooperatives in any country. Their proposition is: *The greater the degree of benefit-participation contingency, the greater will be the participation. That is, the more that a member obtaining benefit from an organization is dependent on his*

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[18]Vicente U. Quintana, Report of the Agricultural Cooperative Development Committee to Exec. Sec. Rafael Salas. Agricultural Credit and Cooperatives Institute, College, Laguna, Sept. 20, 1968.

participating in the organization, the more he will take part. This concept of benefit-participation contingency is an aspect of exchange between the benefits an individual receives from the organization and the contributions he makes to it. The three broad categories of benefit-contingency in organizations are:

(1) Benefits that have no contingency. These are public goods available to members and non-members alike. What would motivate a rational self-interested man to participate in and support an association whose only benefits were available to everyone? Some other benefits must be present besides the obtaining of these benefits.

(2) Benefits which have a moderate contingency. These are system rewards which are available only to members but are not very dependent upon the amount of participation or contribution to the organization. Benefits of this kind, for example, might motivate the individual to become and remain a member, but what would induce him to greater activity than the minimum needed to remain in the organization?

(3) Benefits with a high degree of contingency. These are individual rewards available only to members and, furthermore, only to each member in relation to his participation in or contribution to the organization. If these benefits are sufficiently valuable, the costs low enough and the alternatives less attractive, individual rewards can motivate a great deal of membership participation and support. What is worth-while mentioning with respect to the results of their study of 191 voluntary organizations is not only the fact that their proposition was empirically supported but that "even in the organizations with high contingency the average percent attendance was less than two-thirds of the membership while the average percentage involvement in the meetings and affairs of the group was less than one-fourth."[19]

Another explanation for the viability or lack of viability of the FACOMAS is offered by Wheelock and Janolino who examined the effect of institutional and infrastructural environment. Using the status of FACOMAS as their dependent variable, they operationally defined them as (1) *registered* with the Agricultural Credit Administration (ACA) and the SEC (Securities and Exchange Commission) between 1952-1967; and (2) *reactivated,* which means continuously active FACOMA credit facilities for each of 3 years 1967-68,

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[19]W. Keith Warner and Wm. D. Hefferman, "The Benefit-Participation Contingency in Voluntary Farm Organizations," *Rural Sociology,* Vol. 32, June 1967, pp. 139-153.

1968-69, and 1969-70. From the 15 first-priority rice growing provinces, 182 towns with 1,250-30,000 hectares of irrigated lowland rice were included in their analysis.[20]

The data in Table 7.17 are interpreted by Wheelock and Janolino as follows:

"Irrigation as an index of risk in rice production is curvilinearly related to FACOMA status. . . Towns without irrigation. . . seldom have registered a FACOMA. Only 25 percent of the no-irrigation towns (0-2%) which have FACOMAS have reactivated their credit facility. However, towns having an intermediate amount of irrigation are more likely to have an active FACOMA loaning facility.

Table 7.17. Municipalities with FACOMAS which have reactivated rice-production credit facilities for 1967-70 by percentages of the main crop of paddy which is irrigated.

	Percentage of main crop paddy which is irrigated						
Towns with	*0-2*	*2.1-10*	*10.1-30*	*30.1-60*	*60.1-90*	*90.1-100*	*Total*
An inactive or semi-active FACOMA (1967-70)	75%	67%	57%	37%	66%	70%	111
A reactivated FACOMA credit facility (1967-70)	25%	33%	43%	63%	34%	30%	71
Total number of towns	32	21	30	35	41	23	182

	Percentage irrigated second crop				
Towns with	*0%*	*0.1-3.0%*	*3.1-24%*	*24.1-100%*	*Total number*
Inactive or semi-active FACOMA	69%	50%	52%	79%	111
A reactivated FACOMA credit facility (1967-70)	31%	50%	48%	21%	71
Total number of towns	36	60	44	42	182

Source: G. C. Wheelock and H. Janolino, *op. cit.*

[20]Gerald C. Wheelock and Hilarion Janolino, Effect of Institutional and Infrastructural Environment Upon a Program of Institution Building: The Palay Farmers Cooperative Marketing Association (FACOMA); A Technical Data Report and Preliminary Analysis. U.P. at Los Baños, Sept. 1970.

Sixty-three percent of the FACOMA towns with 30.1-60 percent irrigation have reactivated their loan facilities.

Finally, towns with nearly full irrigation coverage are more likely to be those with inactive FACOMAS. Conservative private capital is already concentrated in these low-risk, rice producing areas. Only 34 percent of the FACOMA towns with more than 60 percent irrigation have reactivated their FACOMAS. This same general relationship can be observed with respect to the percentage of main crop irrigated for the second crop. Towns where rice-production risks are low are the same towns in which conservative private capital will be concentrated. A government rice-production credit scheme with its more cumbersome administration is not a highly valued or scarce resource in these towns. On the other hand, in towns where risks in rice production are intermediate, private capital is scarce and the FACOMA credit resource is more highly valued. The FACOMA is more likely to be active in these towns. Finally, where the risk is the greatest, modern rice production cannot be chanced, and a production credit scheme cannot survive."

The role of risk in the use of credit among debtors and its provision by creditors is illustrated in the case of small but promising farmers' associations which were organized around the need for irrigation water. The ingredients present in six farmers' associations analyzed were:

(1) Membership came mainly from contiguous areas serviced by the same irrigation water source. In the absence or inadequacy of water from the National Irrigation Administration, farmers operating contiguous areas jointly borrowed money to purchase and install irrigation pumps. Repayment of loans was assessed on the basis of farm size operated by individual farmer members.

(2) The stimulus for getting organized came from agricultural technicians whose expertise traced low productivity to the water shortage and saw the development potentials with the advent of irrigation pumps. This was a risky venture, considering the costs involved and the poverty of the farmers. Therefore, their loan application had to be supported by project feasibility studies prepared with the assistance of the agricultural technicians.

(3) The rural banks would not have granted the loans if the technicians had not interceded in behalf of the farmers. But this was not a matter of smooth interpersonal relations but rather a business risk calculation on the part of the bankers. With the presence and

assurance of the technicians that the production process and the application of the loans would be adequately and expertly supervised, the probability of increasing production and then of repaying the loan is considerably enhanced. The risks of the banker in providing the loan are, therefore, reduced.

(4) The farmers would not have taken the risk in borrowing such a big amount of money if they had not been assured by the technicians of their presence and assistance over a long period of time. In other words, this was not a crash program but a long-term commitment on the part of those who were responsible for initiating these village-level development projects. They provided much of the management and supervision required.

(5) Not everyone was invited to join the farmers' association. Membership was limited to 18, 19, 33, 28 and 15. An important criterion was the matter of contiguity of farm areas to be serviced by the irrigation water. In the case of one association, the neighboring farmers who were skeptical before of all these moves to organize finally saw the light when the irrigation water started flowing. They then expressed a desire to join the original 19 members but the latter were not enthusiastic about getting them in because as the leader put it: "Even among nineteen of us, we already have problems in working together. How much more when we add 7 or 9?"[21]

The experience with these farmers' associations which centered on irrigation and credit problems illustrates a *three-way risk reduction scheme with the farmers, the extension worker and the rural banker.* Without the technician, the bank would not lend money, especially to farmers who have no collateral; without the extension worker, farmers are reluctant to venture into substantial credit agreements, particularly for relatively long-term irrigation investment. So, with the extension worker's faith in the production technology, in his own competence and in the eagerness of the farmers to improve their lot, he serves as a guarantor both to the farmers and to the bank.

Other versions of the three-way risk-production scheme are found in the "selda," "damayan," compact farm, etc. The "selda" means cell or unit composed of 10 to 20 farmers required to till 1 to 3 hectares at a maximum so that the farms can be well

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[21]Delia A. Imperial, "Group Action for Rural Development: Insights from Nine Farmers. Associations," Farm and Home Development Office, College of Agriculture, 1971 and P. S. Fajardo, "The UPCA/SEARCA Progress Report No. 5, July 1 to Sept. 30, 1971."

attended to. A unit may cover 20 to 40 hectares. The members act as one body and each is responsible to and for one another. Each one sees to it that the farm of each is attended to. The debt of one is the debt of all. In choosing the site for the selda, presence of irrigation, adjacent farms and farmers' willingness to work hard and improve conditions are the bases. The members sign a contract to follow technician's recommendations, do away with vices, etc. and the landlord must agree with the sharing system under land reform. As a group, the selda members can borrow money from the rural bank anytime without collateral. They can also block-sell their crop to a dealer contacted by the rural bank so they can get a better price. Close technical supervision of the production process is regarded as desirable by both the farmers and the bank.[22]

A slightly different version of the selda is the "damayan" defined by Salvador as a group of farmers preferably composed of people related by blood or marriage and living in one compact area. It is headed by a regional leader respected by everyone in his area. It also has a treasurer who handles all the production reports and an information officer who disseminates modern farming techniques among its members. The damayan concept is based on the theory that people who know each other well and who work for the same cause will help one another. It makes possible a supervised credit scheme which involves a triangular marketing agreement involving the damayan, the rural bank and the marketing agent. The rural bank finances the farmers, the farmers raise the crops and the marketing agent sells the products at prevailing market prices. Cash sales are turned over to the bank against which farmers' loans are deducted. The net profits go to the farmers. Since the well-thought out-farm plans serves as the only collateral, the rural bank owns whatever is produced and the damayan cannot dispose of its products; otherwise, it will be liable for estafa. Faith on the damayan is based on the assumption that "men who borrow together watch each other because they will suffer together if anyone appropriates part of the produce for private use or sells it for individual profit."[23]

A third version is the compact farm which is an organized unit

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[22] R. P. Victorio, *op. cit.*

[23] Florante C. Salvador, Senior Agricultural Credit Examiner, Department of Rural Banks, Central Bank of the Philippines. *Greenfields,* Vol. 2, Nov. 2, 1973, pp. 20-22.

of small farms with contiguous areas. Compact farms may vary in size and operating details but certain principles are common to all: (1) single management by a democratically elected farmer-member; (2) assumption of joint and several liability for supervised production credit from institutional sources; (3) controlled movement of produce and efficient marketing to insure collection of loans and increased profits to producers. Compact farms may or may not pool labor and other resources. They are mainly used as conduit for supervised credit. As such, they rely heavily on technical services provided by extension workers. The latter are indispensable in the preparation of the farm production plan which is the basis for granting the loans. Their technical assistance is also counted upon to improve the production process which is of considerable concern to the lending institutions.[24]

The fourth variation is the Moshav-style multipurpose cooperative located in a small barrio of 111 families, 92 of which are farming and 19 are non-farming. This cooperative is characterized by small size, contiguous fields and residence in the barrio. The latter is a prerequisite for membership but its distinctive characteristic is the presence of Israeli technicians who provide technical advice and leadership. Because of this special arrangement, doubts have been expressed as to the transferability of the approach. De los Reyes, *et al.* also raise questions about the availability and quality of leadership for these cooperative ventures at the village level. They consider the problem of coming up with a class of leaders who can sufficiently identify with farmers and have sufficient authority to effect the goals of cooperatives as a serious one. They believe that the farmer-leader, although chosen by farmers themselves, will get direction from farm management technicians and other government personnel. As he develops close working relationships with them, his identification with farmers is likely to decrease because government workers have also been observed to identify *away* from farmers as evidenced in their manner of dressing, assumption of title "Mr.", carrying of attaché cases and other symbols of office.[25]

Although the dearth of leadership for cooperatives is a valid issue, one wonders to what extent ability to identify with farmers as

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[24]Camarines Sur Interagency Survey Team Report on the Province of Camarines Sur and the Lower Bicol River Basin, September 1972.

[25]R. P. de los Reyes, M. Mangahas and F. J. Murray, *op. cit.*

a leadership quality is validly reflected in similarity of dress and trappings of everyday life rather than in performance of functions which enhance farmers' interest. As a matter of fact, a farmer-leader will have to learn to relate himself to the urban-elite, to government personnel and to the world outside his community in order to more effectively promote the interests of co-farmers.

The other problem encountered in the organization of seldas is the difficulty in some provinces of finding farmers who cultivate adjacent farms and who also reside in the same community. Where farming area and place of residence are not in the same community, communication between farmers who belong to the same selda, which is organized on the basis of adjacent farms, is hard to achieve. If the loans are granted to a joint liability group using contiguity of farms as a criterion but farmers live in different communities, the co-guarantor requirement may not be easy to enforce. Moreover, the selda may not be a meaningful social group to its members when they do not reside in the same place and, therefore, may not have much social interaction.

One feature, however, of farmers' organizations in the past is that members tend to be those who have higher education, higher economic status, higher social status in the barrio, greater use of printed media, radio ownership, number of visits to agricultural schools and experiment stations and also have higher yield.[26] Furthermore, only a very small proportion of farmers belong to farmers' organizations. When innovations are introduced through these farmers' associations, the members have an advantage which non-members do not have. This is also the case with credit made available only to members.

Considering all the shortcomings of credit institutions and farmers' organizations cited by Bergland, Quintana, Wheelock and Janolino, Imperial, Contado, de los Reyes, *et al.*, the New Society's Cooperative Development Strategy for Rural Development embodies measures designed to remedy past weaknesses. Warner and Heffer-man's benefit-participation contingency is also provided for. The following features have been emphasized in the new program:

(1) A gradual learning process in cooperative development passing through a barrio association stage before being organized into a full-fledged cooperative. Only after meeting given requirements

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[26]Tito E. Contado, "Factors Associated With the Active Participation of Rice Farmers in the Local Farmers' Club," *op. cit.*

could one or more barrio-associations (Samahang Nayon) sponsor the organization of such a cooperative.

(2) A mandatory requirement under the land reform program that no land title may be issued to any farmer unless he is a member of a recognized cooperative.

(3) Strict requirements for membership although it is open to lessees, amortizing owner-cultivators and owner-cultivators. They have to: complete a prescribed pre-membership training course; pledge to adopt improved farming practices; comply with a savings program; pay the required membership fee; and comply with Barrio Association's organizational agreement.

(4) A compulsory savings program to generate capital. Members are required to deposit with rural banks: five percent of what they borrow; the equivalent of one cavan of rice per hectare at harvest time as Barrio Guaranty Fund which will be used for payments of amortization of farmers who might default; and ₱5 per month or ₱60 a year for members who do not borrow. The savings of Barrio Associations will be used to buy into the equity of established rural banks.

(5) Shift of credit source from the landlord to the rural bank as a result of the land reform program. Unless the farmers belong to the Barrio Association, it will be difficult for him to obtain credit from the rural bank, since he has no collateral. Both credit and the issuance of a land title are contingent on his membership in the barrio association.

(6) Adoption of improved farming practices as prerequisite to membership. This is a step toward increased productivity which ultimately determines whether or not loans can be repayed. A necessary corollary to this requirement is the provision of technical assistance from government and other agencies.

(7) Central Bank guarantees of up to 85 percent agricultural loans. This is designed to encourage more vigorous lending on the part of rural banks.

(8) An education, information and organizational program which includes sophisticated motivational strategies, communication techniques and monitoring devices.

(9) Discipline under martial law to prevent repetition of earlier experiences with cooperatives such as non-repayment of loans and less dedicated government workers.

(10) Seldas and damayans as nuclei of barrio associations.

These small production units could be valuable training grounds for prospective leaders of cooperatives.

In general, the new cooperative development strategy has all the necessary ingredients for success. It has credit, technical assistance, education and information, risk reduction for both farmers and lenders, opportunities for leadership development, savings and capital accumulation and the possibility of applying negative sanctions when needed. As the Department of Local Government and Community Development put it: "The Barrio Association is educational, mandatory, disciplinary and designed for redistribution of wealth. It is a vital component of the land reform program."

At the moment, the most controversial provision is the compulsory savings which are intended for the purchase of rural bank equity. If this intention is carried through, the Barrio Associations will control the rural banks within a few years. The Central Bank's projections of these savings amount to ₱25.4 million for 1974, ₱55.4 million for 1975, ₱90 million for 1976, and ₱129 million for 1977, or a total of ₱299.8 million in the next four years. Since owners of rural banks are mostly landlords who will be affected by the land reform program, the rural bank is an alternative investment for them. Will the barrio associations be allowed to buy as much equity as they could in the rural bank?

2. *Irrigation Associations*

Besides credit, irrigation is another component of rice production around which farmers are organized to some greater or lesser degree. Because irrigation by its very nature seldom belongs to a single individual, the use, non-use or misuse of irrigation water affect a group or a community of farmers over a small or wide area depending on the size of the irrigation system. This "social" or "group commodity" characteristic of irrigation has made it an interesting subject for study by both physical and social scientists. The effect of physical factors on farmer attitudes and behavior is fascinatingly evident in a number of irrigation studies. For example, Wickham's comparison of farmers' attitudes toward irrigation between those whose fields were located along the first half of the irrigation canal and those along the second half shows that farmers farther away from the water source (second half of the canal) had lower proportion reporting profit from rice farming due to irrigation (89 percent for those along the first half and 55 percent only for those in the second half of the canal). The latter also reported more

conflicts over water and as expected, more of them evaluated water supply as inadequate. Incidentally, their subjective estimates of water adequacy correlated very closely with actual measurements made. Contrary to expectations, those who were farther away from the water source were more inclined to think that irrigation fees charged were reasonable. They were more willing to participate in more intensive scheduling of water and to pay higher fees for supplemental irrigation (Table 7.18). Even more intriguing was the higher cooperation score and greater willingness to share with the NIA the responsibility for cleaning farm ditches among farmers who judged their irrigation water as *highly* inadequate (Table 7.19). The effect of water inadequacy on adoption of recommended practices and on yield is also clearly shown in the difference between those with highly inadequate and moderately inadequate water. Surprisingly those with *adequate* water reported lower adoption scores and lower yields than those with *moderately adequate* water.

In general, Wickham's findings show that farmers who are relatively more "deprived" of water realize its value more than those

Table 7.18. Farmers' attitudes toward irrigation and location of their farms relative to water source.

	First half of canal	*Second half of canal*
	—Percent—	
1. *Profit due to irrigation*		
Yes, wet season only	7	–
Yes, both seasons	89	55
Yes, dry season only	–	5
Yes, wet season only (1 crop/yr.)	3	24
No profit	–	10
Don't know	1	6
	100	100
N =	71	62
2. *Reported conflicts over water*		
No conflicts	89	76
Conflicts	11	24
	100	100
3. *Reasonableness of irrigation fees charged*		
Reasonable	22	48
Too high	78	52
	100	100

Table 7.18 (Continuation)

	First half of canal	*Second half of canal*
4. *Willingness to participate in more intensive scheduling of water*		
Willing	85	97
Not willing	15	3
	100	100
5. *Evaluation of water adequacy*		
Adequate or better	80	59
Highly or moderately inadequate	20	41
	100	100
6. *Willingness to pay higher fees for supplemental irrigation*		
Willing	38	73
Not willing	62	27
	100	100

Source: G. Y. Wickham, *op. cit.*

Table 7.19. Farmers' judgment of water adequacy in relation to yield adoption, cooperation and attitudes toward cleaning farm ditches.

	Highly inadequate	*Moderately inadequate*	*Adequate and up*
		—Percent—	
1. *Reason for water shortage*			
Insufficient water in whole system	55	56	48
Poor distribution	45	44	48
Both	—	—	4
	100	100	100
2. *Yield*			
0 – 1.8	40	7	6
1.8 – 2.6	21	25	38
2.6 – 3.5	21	32	28
3.5 – 4.4	13	24	16
4.4 – 5.3	5	4	8
5.3 – 6.2	—	4	2
Over 6.2	—	4	2
	100	100	100

Table 7.19 (Continuation)

	Highly inadequate	*Moderately inadequate*	*Adequate and up*
3. *Adoption score*			
High	39	64	47
Medium	45	25	39
Low	16	11	14
	100	100	100
4. *Cooperation score*			
High cooperation	60	47	32
Medium cooperation	8	21	31
Low cooperation	32	32	37
	100	100	100
5. *Attitudes toward cleaning farm ditches*			
NIA responsibility	38	63	71
Farmer responsibility	25	33	23
Both	37	4	6
	100	100	100

Source: G. Y. Wickham, *op. cit.*

who have enough and are more inclined to cooperate, pay fees, and participate in efforts to improve the distribution of water either in matters of scheduling or cleaning ditches. Apparently, where a *water problem* exists, there is a reason to participate or cooperate. Where water supply is adequate, water is taken for granted and is not perceived as a problem. Therefore, even the normal irrigation fees charged are regarded as too high. Farmers' preference for individual rather than group-oriented activities is revealed in Table 7.20. Even for ditch-cleaning and pump use, 56 and 44 percent, respectively, preferred to perform the activity individually. The case of water scheduling, for example, is one activity which requires a group orientation, especially where water supply has to be shared but only 27 percent felt it should be a group undertaking. The same thing holds for water control which is impossible to carry out without regard for the group which is affected by the same water supply. This "individualistic" inclination of the farmer is contrary to the romanticized image of Philippine rural community as *bayanihan* (mutual help) society. This mutual help behavior is manifested very much in funerals, weddings, baptisms, house-moving, crisis, and emergencies

Table 7.20. Farmers' attitudes toward selected group-oriented activities (133 farmers from Nueva Ecija, Bulacan, and Laguna, 1971).

	Individually	*Group*	*Unwilling to do*	*Total*
		—Percent—		
1. Ditch cleaning	56	42	2	100
2. Water scheduling	71	27	2	100
3. Water control	60	32	8	100
4. Fee payment	93	5	2	100
5. Pump use	44	50	6	100
Total N = 133				

Source: Gekee Wickham, *op. cit.*

but sustained collective action for continuing development activities remains to be realized. Onkingco's studies of 15 communal irrigation systems, for example, found minimal existence of a sense of communal responsibility and the virtual absence of established operational procedures for maintaining and managing the system and distributing water. In only two out of 15 communal systems was the existence of a farmers' association mentioned.

To manage the irrigation systems, three types of *modus operandi* have been identified:

(1) By tradition or inheritance, someone is assigned the honorary position of being in charge of the irrigation system, and people look up to him for leadership.

(2) Where there are constant disputes among the farmers themselves over water use, they seek the assistance of an authority figure outside their group, that is, a policeman, a mayor, or a landlord, to help allocate water and assign maintenance functions to different farmers within the irrigation area.

(3) The person in the worst position with respect to water supply takes the initiative in calling the farmers together for the periodic cleaning of canals, water distribution, and so on. On an *ad hoc* basis whenever absolutely necessary, farmers can be mobilized for group action but an organization for sustained, regular and systematic management is hard to find in these communal irrigation

systems. The most provocative insight from Ongkingco's studies is the case of one system which had a farmers' association before the repair and improvement on the system was made. With the advent of good water supply, the farmers' association became inactive; they stopped paying fees and the association had no more funds.[27]

The phenomenon of water shortage as an inducement for farmer cooperation and organization is evident in the researches of Wickham, Ongkingco, Cruz,[28] Robinson,[29] Coward,[30] and Lewis.[31]

Coward, however, provides a more purely sociological interpretation of the situation. As he points out: "The scope, form and content of the interaction between ditchtenders and water users in these irrigation systems suggests a pattern of integration that is authoritarian, has minimal farmer participation, and is coincidental with high levels of uncertainty and frustration. It is a pattern of integration better suited for operating and maintaining the system at some present level than for developing the system and improving efficiency and equity in operations. As long as the water user is inhibited from being more directly involved in water distribution decisions, the system will lack feedback information for improvement and development."

Furthermore, he considers smooth interpersonal relations (S-I-R) as a major institutional factor which permeates the relationships between ditchtenders and water users. Coward regards smooth interpersonal relations, defined as getting along with others in a respectful manner, as a very pervasive institution which influences the interaction between ditchtenders and water users. The "ditchtenders attempt to create SIR with water users so they will follow his directions." On the other hand, where there is considerable uncertainty about how much water will be available during any

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[27]Petronio Ongkingco, Organization and Operation of 15 Communal Irrigation Systems in the Philippines in *Water Management in Philippine Irrigation Systems: Research and Operations.* IRRI, 1973.

[28]Federico A. Cruz, The Pinagbayanan Farmers' Association and Its Operation.

[29]David M. Robinson, Making an Irrigation Association a Vehicle for Development: Preliminary Observations on a Group of Philippine Rice Farmers.

[30]E. Walter Coward, Jr., Institutional and Social Organizational Factors Affecting Irrigation: Their Application to a Specific Case. Papers on *Water Management in Philippine Irrigation Systems: Research and Operations.* IRRI, 1973.

[31]H. Lewis, *op. cit.*

crop period, the users exert effort to establish SIR with the ditchtender in order to reduce uncertainty about the delivery of water to his farm. These patterns of SIR between farmer and ditchtenders are mechanisms for minimizing conflicts due to the uncertainty as to the delivery of water. Therefore, *water shortage is again the focal point for the interaction.* If water supply were adequate and its delivery were dependable, one would expect such SIR behavior to be considerably diminished, based on evidences from the other studies cited. The physical factors in irrigation, therefore, deserve to be scrutinized side by side with the institutional factors in order to more fully comprehend the behavior patterns exhibited by farmers.

Lewis, in his comparative study of "zanjeras" or irrigation societies in Ilocos Norte and Isabela, noted the difference in climatic and topographical conditions and how these have influenced the behavior of Ilocano farmers in both areas. He found that rainfall in Ilocos Norte is less evenly distributed and has a long dry season. Isabela, in the Cagayan Valley on the other hand, has normally less rainfall but more evenly distributed and at no time is precipitation absent. Rice is a major crop in Ilocos but it is of no commercial significance. In contrast, Isabela is a wealthier agricultural province with commercial farming and even the smallest towns have indications of urbanization and commercialization. As Lewis observed, the irrigation society functioned very well in Ilocos Norte but in Isabela, it seemed to "suffer from the relative wealth" of the Cagayan Valley. However, his conclusions are cautious: "The specific geographic correlates related to the emergence of cooperative irrigation societies in Ilocos Norte can at least only be suggested. The fact that such irrigation societies are hardly viable in Isabela is, in part, related to the different geographic factors which confront Ilocanos in the upper Cagayan Valley. The situation in Isabela suggests that the special character of the Ilocano, once he is established in a less demanding situation, becomes moderated by the more general imperatives of Philippine culture. In a sense, the difference between the Ilocanos in Ilocos Norte and the Ilocanos in Isabela can be reduced to the rational considerations behind and the resultant changes in behavior. In Ilocos Norte, the range of behavior is very often limited to economic matters and in a large proportion of families involves a relatively low level of subsistence. Isabela permits more than a continuous nagging concern with mere survival.

Some of the Ilocano virtues of necessity have not been maintained or have been less enthusiastically pursued in Isabela."[32]

The Ilocanos who have been proverbially known for their cooperative spirit have had cooperative irrigation societies for a long, long time. A report on them is available as early as 1914 but obviously, these societies had been in existence especially in Ilocos Norte long before this date. As to their reason for being, Christie observed that all the irrigation in Ilocos Norte comes from rivers and springs.

"All the irrigation done in this province depends on gravity. No pumps, water wheels or other mechanical devices are in use. It is of interest to know how the foregoing works and others similar to them have been built and are maintained. No very large landed estates are found in this province. Even the few landholdings of comparatively large extent are almost invariably divided into several parcels separated from each other. Hence, it is but seldom that any man finds it to his interest to build irrigation works of any considerable size for the use of his land. Therefore, the necessary feed canals and other works for bringing water from the rivers to the land must be built by cooperation if they are to be built at all. This state of things has given rise to a large number of irrigation societies. They are of interest to a student of the Ilocano people for two reasons: namely, their importance to the agriculture of the region and their indication of the capacity of the people for cooperative effort."[33]

Because of the critical role which irrigation societies perform "the members are bound together by a written agreement which prescribes the organization of the body and the field of its operations, defines the duties of its members and provides penalties for disobedience which range from a small fine to expulsion from the society and confiscation of a member's share in the irrigated land." Case studies reported in 1972 illustrate how long these irrigation societies have endured. Ongkingco describes two systems both of which have limited water supply during the dry season and, therefore, water has to be rationed and delivered accordingly to the supply from the source and the needs of the crop. When problems

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[32]H. Lewis, *op. cit.*

[33]Emerson B. Christie, "Notes on Irrigation and Cooperative Irrigation Societies in Ilocos Norte," *The Philippine Journal of Science* Vol. IX, No. 2, April, 1914, pp. 99-113.

arise in drawing water from the system, the farmers organize themselves to discuss possible remedy. They offer their services to do the work rather than wait for the irrigation office to do the job.

All of these studies done on irrigation associations by different researchers independently from each other and in different places illustrate that in rice farming, *necessity or the need for water is the mother of organization.* The Ilocano's long-standing tradition of irrigation cooperative societies is a response to their environment which has been very much incorporated into their way of life. The Ilocano, even if uprooted, brings some of these cultural patterns with him although as Lewis pointed out, the cooperative society tended to "suffer from the relative wealth" of Isabela.

Hackenberg,[34] however, presents a picturesque description of how a rice village responds to the increasing demands placed on its resources. He begins by challenging the usual picture of a rice village as "a closed corporate community with involution as a dominant process," structurally characterized by "subsistence agriculture, control of land by kin groups, village endogamy, isolated, resistant to change, outside the market and wage economy." Involution is described as "the capacity of villages dependent upon wet rice agriculture to accommodate increasing population by intensification of cultivation, i.e., by absorbing increased members of cultivators on a unit of land." Hackenberg argues that if structural rigidity were characteristic of the village, then it would dissolve, disintegrate or deteriorate with the combined effects of population growth and declining crop yields. He offers to offset this gloomy programs by introducing the observation that some agricultural communities have the cybernetic potential for self-transformation which enables it to deal adaptively with a changing environment. Farming villages in Davao have demonstrated a capacity for structural change through a form of selective autonomous migration which he calls *adaptive radiation.*

Hackenberg presents two case illustrations of such a phenomenon, the *Cebuano corn cultivators* from Argao and the *Ilocano rice cultivators.* In the first case, the primary contributor to the migration stream is soil depletion because 90 percent of the total soil cover in Cebu is suffering from various degrees of erosion and on more than a third of the island, all of the top soil has been removed.

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[34]Robert A. Hackenberg, The Cybernetic Village: Adaptive Radiation as a Social Process, Publication No. 134. Institute of Behavioral Sciences, University of Colorado.

With population pressure on hillside farms and diminishing productivity, the owner-operators moved to the lowland villages and farm as tenants in small rice or coconut fields supplemented by income from upland corn at average yields of 4 to 5 cavans per hectare per crop for three crops year. As the land prices along the coast went up, upland corn dropped and some other occupations like milkfish ponds, handicraft, and home textile manufacturing were resorted to. However, since 1918 migration became an alternative. This was possible through a transfer of heirship rights to the owned land in exchange for the price of resettlement in Mindanao. Obviously, those who were landless or whose lands had become worthless did not have the opportunity to migrate to Mindanao. This migration meant economic security. In Cebu the areas they were cultivating ranged from .5 to 5-6 hectares while in Davao, they cultivated between 2-3 to 15-16 hectares. Yields were also higher in Davao.

Unlike in Cebu, Davao's ecological stress is not soil depletion, for little of its land has been removed from cultivation and rice yields in the area tend to be higher than the national average. The population stability of the region is attributed by Hackenberg to their irrigation societies called *zanjeras* which perform the labor essential to production of wet rice. The communal labor organization of *zanjera* handles 50 to 100 hectares with about 50 farmer-operators. The procedure is for the zanjera to make a labor assessment of a number of days per month against its membership and assign the tasks which must be performed (diversion dam construction, canal maintenance, bridge and road construction). Those who do not contribute labor are fined an equivalent sum and others are hired to take their place. Fields are not owned communally but are worked communally, as farm sizes diminish through inheritance and as the number of parcels per farm increases, the distance between them becomes greater. An heir acquires fragments within the domains of a number of zanjeras and each parcel carries with it an obligation to that association. To solve this problem of fragmentation and decreasing farm size, several measures are resorted to: (1) combining owner-operator with tenancy; (2) planting of cash-producing, dry-season crops; (3) heavy investment in children's education, thus permitting them to secure government employment; (4) seasonal migratory labor in all parts of Luzon; and (5) agricultural resettlement through migration. However, only landowners of one-half hectare or more are apt to consider resettlement in Mindanao.

The process of *adaptive radiation* described by Hackenberg

becomes even more intriguing because the Ilocano migrants brought with them their irrigation associations. The first zanjera in Davao was founded by 18 Ilocanos who found their 10-hectare field lots interspersed with corn grown by Cebuanos and Boholanos. In exchange for a right of way, they gave free irrigation water for one hectare. With this one hectare, Cebuanos started to plant rice as they saw it done by the Ilocanos. Having learned how to grow rice, the Visayans asked for full membership in the zanjera which the Ilocanos accepted in view of their need for additional labor to improve roads and maintain ditches. In 1963 the number of zanjeras increased to 16 with 632 members farming an average of 7.3 hectares. The 16 were merged into a Federated River Association with responsibility for evaluating and apportioning water supply during the dry season. This federation was also large enough to function as a farmers' cooperative marketing association for purposes of government price support and other functions. This community coalition was sustained by the threat of water shortage which an individual alone was unable to meet. As a matter of fact, *irrigation* and *education* were their two means of upward social mobility, and social control was achieved through a value premise of "we are all equal here." Because of the desire to preserve this premise of *equality,* tenancy was avoided. Instead, mechanization and hired farm labor were utilized.

Since expansion of landholdings was also destructive of the egalitarian principle, the need to improve income was achieved through increased crop yields in fields which were approximately of equal size. This was done through crop diversification, double-cropping and use of high-yielding varieties. It was said that the IR-8 seed kits when distributed earlier were not sufficient to meet the demand. They were also trying to grow a third crop which was unheard of in the area. Japanese tractors were also beginning to appear.

One wonders at this point why the Filipinos have to look to the *kibbutz* and the *moshav* of Israel and to the farmer's associations of Taiwan for models of farmers' organization when something truly indigenous is available right in Ilocandia and its extensions in Mindanao. In interpreting this phenomenon, however, it is important to look at both the socio-cultural and the environmental variables which interact to shape farmers' organizational behavior.

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